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ANNUAL REPORT

OF THE

SECRETARY OF INTERNAL AFFAIRS

OF THE

COMMONWEALTH OF PENNSYLVANIA.

PART III.

INDUSTRIAL STATISTICS.

VOL. XX.

1892.

HARRISBURG:
EDWIN K. MEYERS, STATE PRINTER.
1893.



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REPORT

OF THE

Bureau of Industrial Statistics.

COMMUNICATION.

DEPARTMENT OF INTERNAL AFFAIRS,
HARRISBURG, PA., *May 1, 1893.*To His Excellency ROBERT E. PATTISON,
Governor of the Commonwealth of Pennsylvania:

SIR: In compliance with the requirements of the constitution, I have the honor to submit herewith, for transmission to the General Assembly, the Twentieth Annual Report of the Bureau of Industrial Statistics, the same being Part III of the Report of this Department, for the year ending November 30, 1892.

I am very respectfully,

Your obedient servant,

THOMAS J. STEWART,
Secretary of Internal Affairs.

AMERICAN
YACHT CLUB



LETTER OF TRANSMITTAL.

HARRISBURG, *May 1, 1893.*

Honorable THOMAS J. STEWART, *Secretary of Internal Affairs of the
Commonwealth of Pennsylvania:*

SIR: I have the honor to present herewith the Twentieth Annual
Report of the Bureau of Industrial Statistics.

Yours very respectfully,

ALBERT S. BOLLES,
Chief of Bureau.



THE TANNING INDUSTRY OF PENNSYLVANIA.*

The art of converting the hides of animals into leather has its origin at a very early period in the history of the affairs of men. Indeed, there is hardly a page in the record of the growth of the race, however early, upon which we do not find that the products of the skins of beasts, in some form or another, have played a part—often a prominent part—in the events narrated. From the crude appliances and long processes in vogue in the times of Simon the Tanner, upon the shores of the Great Sea, have grown by gradual improvements and innumerable inventions, together with study and practice, the mammoth plants now scattered through the tanning districts, and which in this state alone represents an estimated value of \$20, 553, 456. While this is the first effort of the Bureau to incorporate the statistics of the leather business into its annual reports, it is hoped that the figures now published will awaken a desire to know more of the business which has become of so much importance and holds so high a position in the commonwealth's great industries.

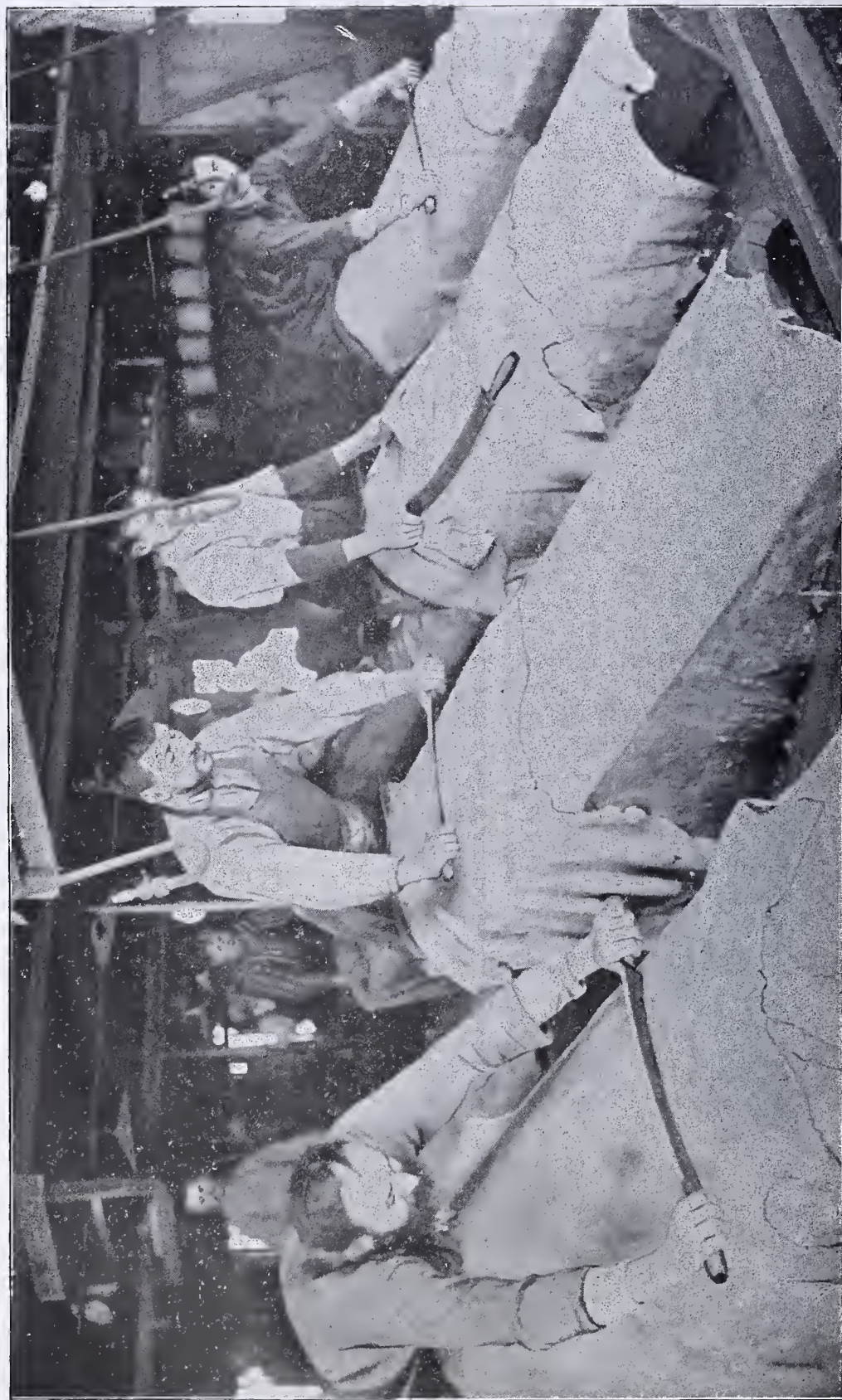
Before entering upon a description of the various processes and methods used in tanning, it is well to consider what materials are necessary, how and for what obtained, and what should be done to procure the best results. Tannin, or tannic acid as it is more commonly called by tanners, is the all-important substance used in tanning leather, and is found to exist in a great variety of plants, in the bark of several species of trees and in a few mineral deposits. The tannin, in some instances, is extracted before using, in others it is used in connection with the material containing it. Terra-japonica contains from thirty to forty per cent. of tannic acid, and was used for tanning purposes at a very early date, and is now used in England quite extensively. Sumac (leaves, bark and the wood) contains from twenty to thirty per cent. of tannic acid, and is advantageously used by tanners where fine color and pliability of the leather are the chief objects sought after. The legumes of dividivi and wattle bark contain from twenty-five to thirty-five per cent. of tannic acid, and are used in the countries where they grow quite extensively, and are imported into other countries in limited amounts, and used by tanners to add weight to the leather, as well as to tan it. Oak and hemlock bark contain from ten to twenty per cent. of tannin, and are the chief sources from which the tanners of Pennsylvania derive that substance. Oak bark is very popular among the tanners, chiefly be-

* The descriptive part of this industry was prepared by request of the Bureau by the Hon. J. L. Brown.

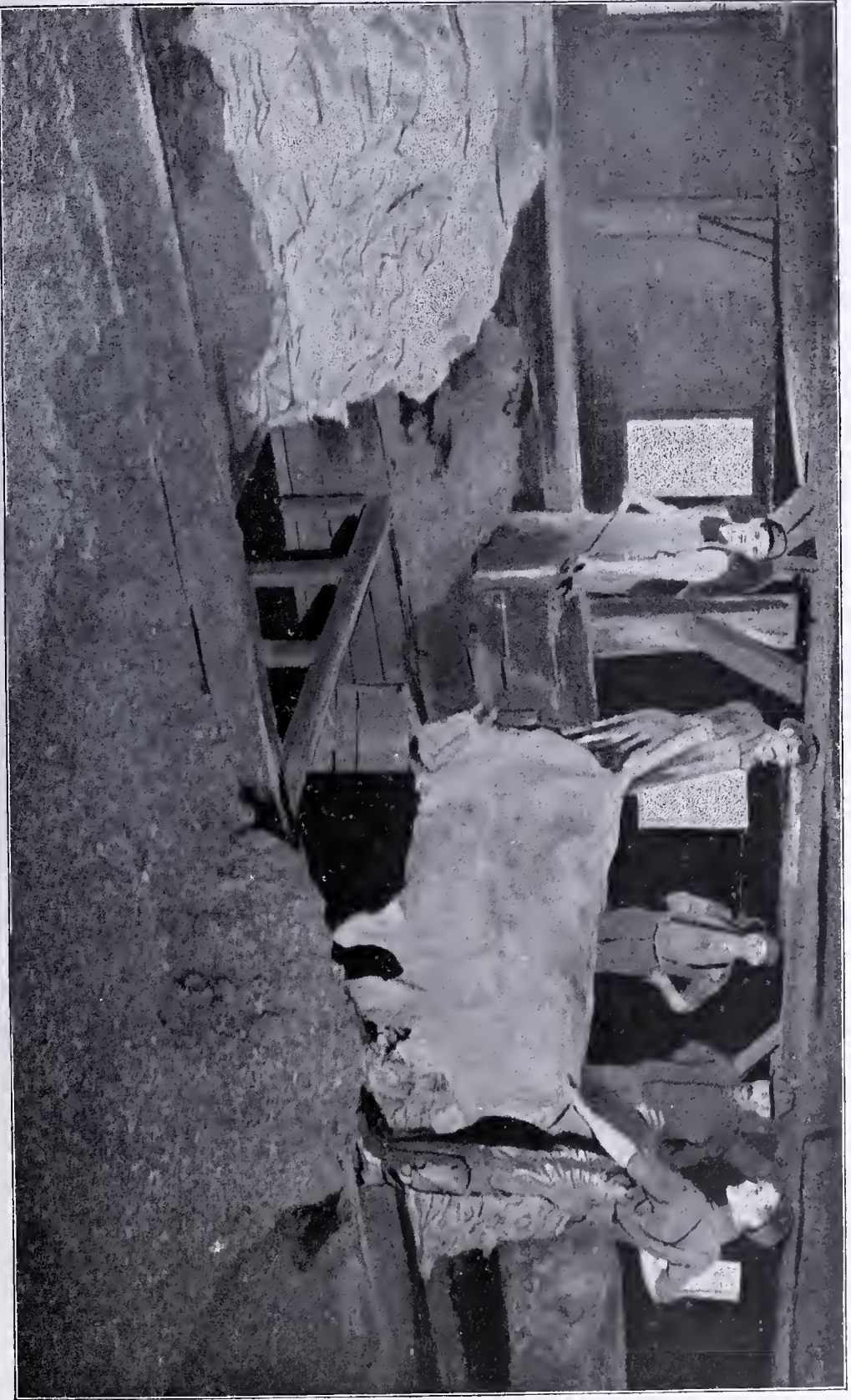
cause of the fine color it gives, as well as the firm, solid and durable characteristics of the leather produced by its use. It is not very abundant nor easy of access, and therefore very expensive as compared with hemlock bark, with which, in making Union leather, it is used in combination. Hemlock bark is the favorite of those who produce the rougher and heavier classes of leather; for in consequence of the ease of getting it and its abundance, it can be delivered at the tannery at a very much less cost than oak. In addition to its tanning properties, it contains a great abundance of coloring matter in its thick ross, which makes the leather red and greatly adds to its weight; this latter feature adding to the tanner's profit. Bark is taken from the trees during the months of May, June, July and August, the work being done by the cord, for which the peeler gets from \$1.50 to \$1.75 for peeling and piling the bark and clearing out the roads over which it is to be hauled. Oak bark costs about double these prices to get it into the same shape and conditions. The process of peeling and curing the bark is a trade by itself, and one that requires care and attention so that the bark be in good condition and its constituents properly preserved. The peeler first cuts through the bark all round the tree, as near the ground as possible, and again at a point four feet above, then removes the ring between the cuttings. The tree is then felled, the bark cut into rings four feet long, stripped off the tree and spread out to dry with the flesh side up. When sufficiently cured it is put into piles so constructed as to prevent the water gaining access, and preserve the bark in the best possible condition. The bark should be piled with the ross up, otherwise the flesh will be discolored and much of the tannic acid wasted. From these piles the bark is removed, either upon drays, sleighs, wagons or cars, as the locations and conditions require, to the tannery grounds, and there piled into large stacks ready for use.

The supply of hides and skins used by tanners is procured from the slaughter houses in our own country, east and west, principally Texas, New Mexico and Kansas and Mexico, Central and South America, Africa and India. It is a gratifying fact that nearly all of the hides produced in the United States are manufactured into leather by our own tanners, as well as from two to two and a half million hides, and about five million skins imported annually from other countries. Boston, New York and Philadelphia are the chief receiving ports at which the imported hides are entered, a few finding their way hither through other ports, as matter of course. Hides are listed commercially under two classes, "dry" and "salted," known among tanners as *green* salted, and are so classed because of the manner in which they are preserved or cured.

Sole leather is the product of the heaviest ox and cow hides, while the different kinds of upper leathers are the product of the hides taken from the young cattle and those of smaller growths. Horse hides, which are almost exclusively converted into upper leather, are not favor-



BEAM HOUSE.



LAYING AWAY THE PACKS.

ites among the tanners of this country, but are very successfully handled in Europe. The tanners of Cordova, Spain, have for a long time enjoyed a high reputation for making a very fine quality of leather from horse hides. The hides of the American bison were very successfully converted into leather—mostly sole—which found favor among the manufacturers of ladies' and children's shoes. This class of hides have almost entirely disappeared from the markets, in consequence of the annihilation of the herds that once made the western plains so famous. The Calcutta buffalo hides produce a leather similar to the bison, and takes its place in the shoe factories. A leather that is very popular for saddle seats is made from hogs' skins, but is not considered valuable for any other purpose. The skins of the deer are made into leather, usually by the alum process, that is valuable for heavy gloves and mittens, and when nicely finished is sold for "white leather," an imitation of chamois skins. The leather made from sheep skins, while of poor quality, is put to the greatest variety of uses. These skins are usually tanned by the alum process, very frequently with the wool on them, and by the use of the anilines are made into leather of a great variety of colors, and is used in the manufacture of thousands of cheap articles and as linings. The finest leather for ladies' wear is made from goat skins. Millions of these skins are imported into this country annually, and by our tanners made into several varieties of leather, all of which are of good quality.

The skins of animals are composed of two almost distinct parts, the cuticle or epidermis, in which the hair is rooted, and the true skin, called the corium, made up of numberless interlacing fibers forming interstices which contain a gelatinous matter which renders the hides flexible, renews the substance of the cuticle and supplies nutriment for the hair that grows therefrom. The tanner, to successfully convert the hide into leather, must seek some process by which he can form a perfect combine of the fibrous and gelatinous matter in the hide with the tannic acid. Whether the combine be chemical or mechanical, is of no moment whatever to the tanner, as his success depends only on making the tannin and hide elements unite. Having thus briefly noted the character of the work to be done, the materials to be used and the results to be accomplished, we can now enter upon a study of the processes, methods, appliances, utensils and machinery used by tanners, as well as the manner of utilizing them in converting hides into leather.

A tannery, without including its motive power, which we need not consider in this place, consists of a bark mill, in which the bark is ground and made ready for the leaching process; a leach house, containing leaches into which the ground bark is conveyed after the grinding; the heaters, in which the fluid is raised to the proper degree of temperature to be run on the ground bark in the leaches; the coolers, in which the liquor is reduced to the right degree of temperature to be

used in the process of tanning; the soaks, in which the hides are first put in the process of softening and cleaning; the hide mill, a machine used to more thoroughly prepare the hide for the sweat vault; the sweat pit, wherein the hides are hung and "sweat" until the hair is loosened; the beam house, where the hair, fleshings and other useless matter are removed and the hides are thoroughly washed; the yard, which is an assemblage of vats usually six feet wide, nine feet long and six feet deep, set on a common plane and divided into sections, which are called "handlers" and "lay aways;" the rolling room, where the leather is finished, and the drying loft, which usually includes the shipping room.

The bark mill is supplied with a suitable number of cast-iron grinders constructed very much after the plan of coffee mills, but of course much larger, which are set below the floor of the room. The verticle shaft which imparts motion to the grinders extends above the machine far enough to receive an iron cross head or cracker. Attached to the floor, over each machine, is a circular sheet-iron hopper about three feet high and in the form of an inverted truncated cone. Into these hoppers the bark is thrown, and the cross head mentioned above cracks it into pieces from two to four inches long, which fall into the mill below and are ground to about the size of buckwheat. Connected with these mills are conductors which carry the ground bark toward the leaches. Various machines, some provided with belts to which buckets are attached, others with drag chains have been used to conduct the ground bark from the mills to the leaches; but of late a pneumatic conductor has been invented, which is being generally adopted by the tanners. It is simply a sheet-iron pipe, perhaps sixteen inches in diameter, and long enough to fill the space between the mills and the leaches, into which, by means of a powerful fan, the air is impelled with sufficient force to carry the ground bark, as it drops from the mills, through the pipe to the leaches. This machine was invented by Arlington and Curtis Manufacturing Company, of East Saginaw, Michigan. Another method of conveying the ground bark to the leach room is somewhat of a favorite with tanners, and consists of a plank conduit about two feet wide, set on a slight incline in the direction of the leaches, into which, by means of an elevator, the ground bark is dumped near the upper end, at which point a supply of water or spent liquor (heated if hot process of leaching be used), is admitted and washes the bark down the incline to the leach room. This scheme has the advantage of partially leaching the bark while in transit. It may be asked by the casual reader why the bark mills are not put in close proximity to the leach room, and thus save the expense and trouble of providing conductors of any kind. In reply to this inquiry it may be said that in and around the bark mill abides the great fire hazard of the tannery. The dust produced in grinding the bark accumulates in all the secret spaces of the building, and is an incendiary of the vilest order. It has been charged with spon-



ROLLERS.



BARK STACKS.

taneous combustion on more than one occasion by the victimized tanner. It, therefore, behooves the builder to place the bark mills as far from the other buildings as possible.

The leaches are simply circular tanks about thirteen or fourteen feet in diameter at the base, and sixteen at the top and eight feet high, resting on a floor high enough to enable the operator to run the liquor into the coolers without the aid of a pump. The process of leaching the bark is a very simple one. The leach is filled with dry bark and water or spent liquor is run upon it until the whole mass is thoroughly saturated. After remaining a time in this condition the tannin contained in bark will have found its way into the fluid, and in combination with it formed new liquor, which if strong enough, is run into the coolers (if hot), or vats (if cold); if not as strong as desired, it is pumped into a neighboring leach, filled with new bark, and so on until the degree of strength required is obtained. Other modes of leaching have been in vogue and are still in limited use. Among these are the "press leach" and the sprinkler, each in their way doing the work fairly well, and having friends and advocates all along the tanning line.

Before entering upon the description of the heaters and coolers, it may as well be stated that neither of them is used where the leaching is done by the cold process, because the fluid is pumped from the water reservoir (if water be used), or from the vats of spent liquor directly into the leaches; but where the hot method is applied, the heaters and coolers are necessary. One mode of heating the liquid before it is run upon the bark, is to force live steam into a tank containing the liquid. This of course heats the fluid and is all right if water be used to flood the bark, but if spent liquor be used, the condensation of the steam so admitted deteriorates it to such an extent that the tanner suffers a material loss. To overcome this difficulty several machines have been invented which are being put into use and doing good service. Notable among these is the invention of a gentleman who resides at Olean, New York, and consists of a large tank with a system of brass piping inclosed. By passing live steam through the pipes the liquor in the tank is rapidly heated, without the invasion of the steam condensation. This machine is also used as a cooler by reversing the order of operating. The tank is filled with the heated liquor and cold water run through the piping, which, of course, produces the desired result. Mr. A. A. Clearwater, of Wilcox, Pa., has obtained Letters Patent for a heater that is somewhat novel in its way. One of these machines is now in operation at the Wilcoxon tannery, and although it has not yet been thoroughly tested, gives promise of being the best method thus far devised. A canal made of sheet copper four feet wide, forty feet long, by about one foot deep, is divided laterally by partitions two feet apart, which reach nearly across the canal, leaving a space at one end of each about eight inches wide; the spaces alternating to the opposite side at the

next partition, and so changing throughout the length of the canal, thus forming a zigzag channel. This rests upon a wood box of the same size and partitioned in the same manner. These partitions in the wood box are just high enough to give the copper canal a firm resting place. The machine is set on a slight incline longitudinally, so that the fluid admitted at the upper end of the copper canal will flow along the zigzag channel to the point of escape at the lower end, and steam admitted into the wood box at the lower end, passes along the meandering conduit under the liquor in the tank, only in the opposite direction. It will be observed that the fluid, as it approaches the point of escape, is directly over the steam at its highest temperature, so that the degree of heat in the down flowing liquid is increased as rapidly as that in the upward passing steam is decreased. This machine, by a little modification, can be converted into a cooler, which will undoubtedly be done if it be a success as a heater, of which there is little doubt at present. The coolers now generally in use are open tanks into which the heated liquor in the leaches is run, and in which it is allowed to remain until its temperature is properly lowered. This is a simple plan and would be desirable enough, only that "time" is an important item to the tanner.

The soaks are vats about the same size of those in the yard, set at the same level, but together with the pools (in which the sides are rinsed before they are taken to the handlers), are appurtenants of the beam house. The hide mill is a ponderous affair, although simple in mechanical structure, and consists of a heavy hardwood plank box, about two and one half feet wide, ten to twelve feet long and two feet deep, secured by iron bolts, lined with heavy plates of iron and firmly fastened to a solid foundation; two hard wood double-faced pounders, reinforced at the ends (faces) with heavy plates of iron numerous perforated to receive headless bolts of round iron, which are driven through the plates into the wood, but are allowed to protrude externally about three inches, thus forming a kind of teeth to aid in softening the hides; two vertical arms or handles, about eight feet long, firmly inserted in the pounders at the lower ends, and suspended by a joint or vibratory attachments at the upper extremities and two horizontal pitmans connecting the arms with the double crank shaft which imparts motion to the machine. These pounders are suspended in the box side by side, nearly filling the space laterally, but having room enough for them to move without friction, and by means of the double crank shaft are made to oscillate in opposite directions. The structure is so arranged that when the pounders are at their extreme points of oscillation, there remain narrow spaces at the ends of the box for the hides, in which they are worked and pounded until thoroughly softened and made ready for the sweat pit. The hide mill is not used in tanneries where the lime process is in vogue, and the same can be said of the sweat pit. The lime does the work of both of these appliances, but as heretofore intimated, requires great



GRINDING THE BARK.



WILCOX TANNERY.

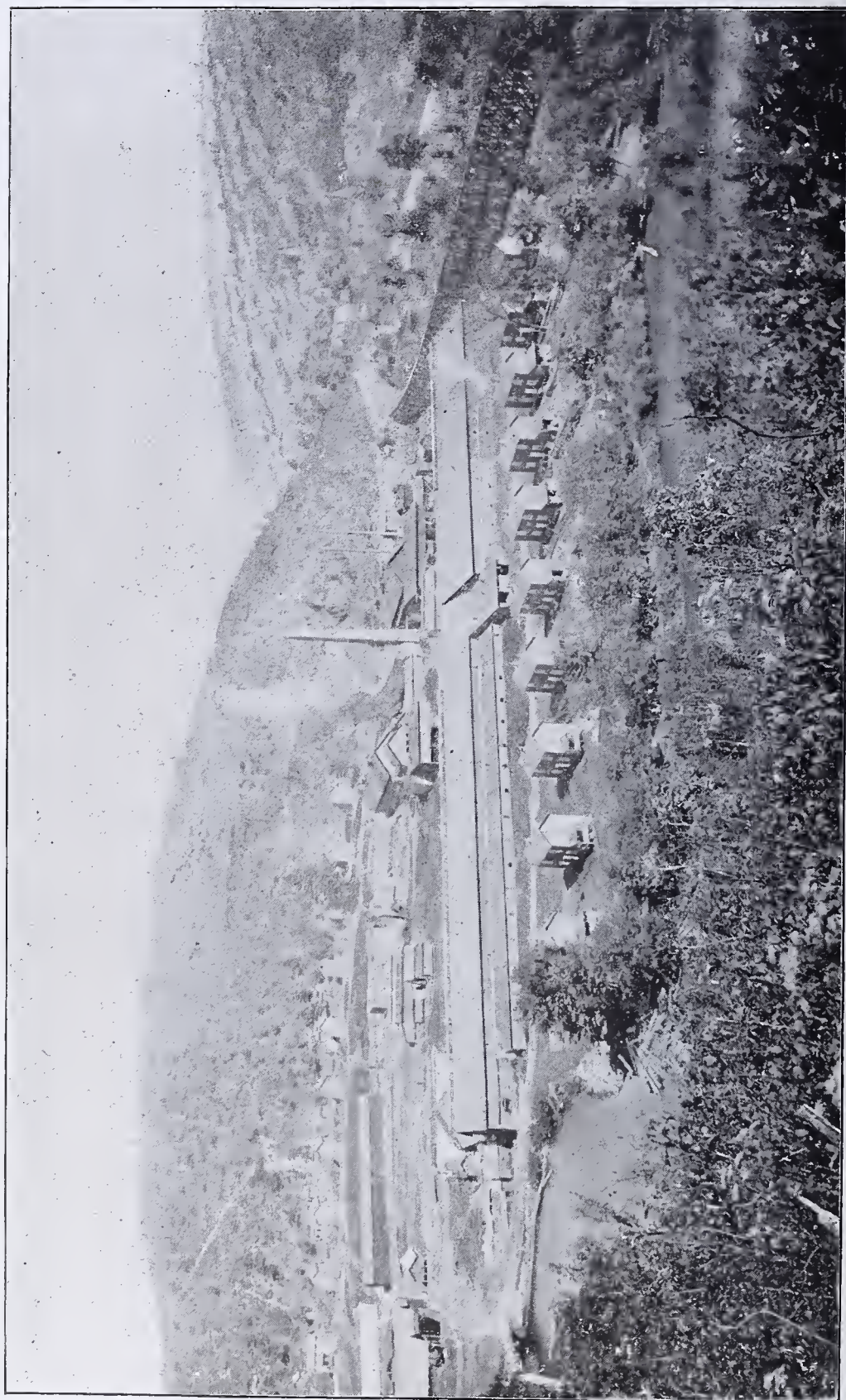
care in using it. The tanners of Union leather usually employ the cold leaching process and lime method, therefore the heater, the cooler and the sweat pit are not parts of their plants, and this can also be said of upper and harness leather tanners. The sweat pit is a marvel in itself. Of all the odoriferous institutions brought forth by nature's laboratory, human ingenuity or animal depravity, the tanner's sweat pit, may take the prize. It is not because of the volume of the effluvium that pervades these institutions, that this meed of praise is written, but because of its intense density. However it has other uses than keeping the dogs and tramps out, therefore it must be endured. It is an underground structure, and consists of a long dark alley with vaults, about eight feet square, closed by means of doors next to the alley, on either side of it. It is a simple affair, but of great value to the tanner.

The beam house is a very busy place and interesting to persons making their first visit. It is provided with an abundance of light, and the operatives appear to make use of it to the very best advantage. The beams upon which the hides are worked, are about six feet long and two feet wide, straight longitudinally, but in the form of the segment of a cylinder laterally. They are set at an incline, with the operative standing at the highest end facing the light. In addition to the beams and the utensils used in connection with them, the pools, the soaks and the lime vats (if the tanning be done by the lime process), forms part of the beam house. The yard is simply a system of vats supplied with lines of pipes, both under them and near the top, the upper line to convey the liquor to the vats, and the lower line to convey the spent liquor back to the leach house. The sections into which the yard is divided differ somewhat according to the plan of tanning the leather. Where the sweat pit plan is in vogue, the first sections are called handlers, and are provided with reels to be used in changing the leather from vat to vat; if the lime process, the handlers are provided with rockers, on which the leather is hung and made to move up and down in the liquor. The lay-aways are the same in both plans, as well as the mode of operating. The roller, which is used by sole leather tanners, is usually made of brass, five inches in diameter and nine inches long, attached to the lower end of a pendulum-like arm, by means of gudgeons, and suspended over a solid metal bed which is planed flat laterally and concave to suit the oscillations of the roller longitudinally. The motion of the roller is produced by means of a horizontal pitman, and in substantially the same manner as in the hide mill. The desired pressure is obtained by means of a foot lever which forces the bed upwards. The building in which leather is dried is called the dry house. There is no uniformity in the plans adopted for the construction of dry houses and the result is they differ materially in style and architecture. Some of them are six stories high, and others are two. Some tanners use high temperatures to dry the leather, and others a moderate degree.

The scrubbing room is an appendage to the rolling "loft." Its machinery usually consist of a lot of heavy splint brooms and strong men to handle them. Numerous inventions have been tried, but a man with a broom is the safest appliance yet used. Too much washing is to be avoided, because the tannin, which has cost so much time, labor and money to get into the leather, is easily taken out if the scrubbing is not done with care. The shipping room, wherein the finished leather is stored and waiting transportation, is an appendage of the rolling loft.

The preceeding pages have been devoted to the description of the different parts of a tannery, and to the manner of producing the liquor, so that the reader may the more readily understand the tanning processes which are now about to be considered. Perhaps the proper course to pursue is to follow a pack of hides through the different stages of tanning in their regular order, by one or the other of the popular processes now in vogue; noting, as they occur, the points of divergence when the other plans are used. In other words, all known plans of tanning start with the same process—the soaking of the hides—where the lime tanner goes one way and the sweat-pit tanner another, thus making a point of divergence in the work. The writer will endeavor to lead the reader along the line of the sweat-pit plan of tanning in such a way as to make the work plain, at the same time briefly reverting to the other processes as they diverge from the one under consideration.

Let it be remembered that the object in all processes in tanning is to unite, permanently, the tannic acid with the elements of the hide, as has already been intimated, and that all the work should be applied in such a way as to attain to that end the most expeditiously and successfully. Before this can be done the hides must be thoroughly softened, divested of the hair, fleshings and other *impedimentia* and nicely cleansed and rinsed. For the purpose of softening the hides they are first placed in soaks, which the reader will remember are large vats filled with pure water, where they are allowed to remain from six to ten days, if dry, or one day, if green. Much depends on the character, or rather the condition of the hides. Dry hides, which have been improperly cured, and consequently not in perfect condition, will not be allowed to remain in the soaks as long as those in perfect condition, lest they decay and become worthless. When taken from the soaks the hides are usually cut through the middle of the back, thus forming two "sides," or trimmed by cutting off the flanks, pates and bellies, leaving what is called "butts." "Crops" are sides trimmed in the same manner as the butts. If the hides were to be tanned by the lime process they would now be put into the "bate" or lime vat, to loosen the hair and swell the hides, and thus prepare them to receive the tannic acid; but in the sweat-pit process are put into the hide-mill, and there further softened, and the hair somewhat loosened by the pounding they get in that machine. When taken from the hide mill they are about in the condition they were when taken



ROLFE TANNERY, JOHNSONBURG.

from the animal's back. They are now hung in the vault of the sweat-pit. In America the "cold sweat" is usually followed, while among the English and German tanners "warm sweat;" the temperature of the latter being about 100° F., and of the cold sweat below 65° F. The hides are allowed to remain in the vault of the sweat-pit until the hair is thoroughly loosened, which requires from one to six days, just according to the condition of the hides. Here, as well as in the bate, is the critical period of the tanning process. The hides must be carefully watched, as the change, which found its origin in the soaks, proceeds much more rapidly in the vault. An hour's delay after the hides have reached their proper stage in sweating, may destroy them; so the "sweater" must not only be an expert but give the work his undivided attention. The vault, being subterraneous and well shut in, is filled with an atmosphere thoroughly laden with ammonia and moisture, hence the process of decomposition is very rapid. The hides are now remilled with pure water running upon them. This removes a portion of the hair and further softens them. They are then taken to the beam-house and undergo a thorough cleaning at the hands of the operatives.

This prepares them for the liquor. It should be borne in mind that by the lime process the hides at this stage are in a better condition for the reception of the tannin than those that have been treated by the sweat-pit method. Some means are always necessary to overcome this difference, and are found in the use of acids. Some tanners resort to the use of sulphuric acid in the weaker liquors, which is called the acid process, and others simply treat the hides in vats of old soured liquors. The desired result is much more promptly attained by the use of the mineral acid, but the quality of the leather is jeopardized by its introduction into the liquors. The use of the old sour liquors, which have been found by analysis to contain acid elements to a considerable degree, opens the pores of the hides and distends the fibres less promptly, but with less danger of doing injury to the leather. The sides are now sewed or tied together, end to end, placed in the first handler containing very weak liquor, and reeled every few hours, until at the last vat in the section they are in liquor of about 15° of strength. There are usually from fourteen to eighteen vats in a section of handlers, so the sides undergo a like number of changes, from weak to stronger and stronger liquors, before they are ready to receive the lay-away treatment. Usually in the lime process the sides undergo the handling treatment by the use of "rockers," on which they are hung and made by means of cranks to move up and down in the liquors. The liquors, in this scheme, are changed by pumping out the weaker and letting the stronger into the vats, instead of changing the hides from one vat to another.

The sides are now separated and transferred to the lay-away vats, where they undergo the final treatment in the liquor. They are, one by

one, laid in the vat, carefully smoothed out, and a shovelful of ground bark sprinkled between them. When the pack is thus laid away the vat is filled with liquor about 12° of strength, in which they lie from ten to fifteen days, when they are taken up and laid away in a like manner in the next vat. The liquor in the second lay-away is about 18° of strength, and the time allowed the sides therein is from twelve to twenty days; in the third lay-away the liquor is 20° to 23° of strength, and the time allowed the sides about thirty days; in the fourth, 25° and thirty to forty days; in the fifth, 28° and stronger, and the time in this lay-away, as well as in the sixth and seventh, depends on the necessities of the leather, the judgment of the tanner and the kind of leather being made. The lay-away process requires about four months to tan heavy hemlock sole leather. Oak leather and extra heavy hemlock are usually given from fifteen to twenty days more time. In tanning sole leather the chief object is to get the greatest possible quantity of tannin into the hides in the shortest possible time and retain it permanently there. "The gain" in tanning sole leather is one of the chief sources of profit to the tanner, and in some instances amounts to from 160 to 180 pounds, that is, from 100 pounds of dry hides 160 to 180 pounds of sole leather are made. Therefore, up to the end of the work in the lay-away, everything should be done with a view to making the gain as large as possible. The softening of the hides in the soaks and hide mill, the swelling of the epidermis in the sweat-pits, treating the sides in old sour liquor, the reeling of the sides from one handler containing weak liquor to another filled with stronger, and the progressive laying away the sides, have all been done chiefly to augment the gain in the leather. The leather is now taken to the scrubbing room to be cleaned. This work must be carefully done, lest the tanning elements which have cost so much time and labor to inject into the leather be scrubbed out of it. This done, the leather is taken to the drying loft, where it is hung in rooms from which the light is partly excluded, too much light having the effect to discolor the grain of the leather, which is considered injurious by the consumers. When partly dried the leather is taken down and "sammied." This is simply a process of moistening the grain of the leather and treating it to a slight dressing of oil to make it flexible and mellow, ready for the roller. The leather is then rolled, first on the flesh side, and finally on the grain, which finishes it ready for market. It might be well to call the reader's attention to the fact that in lieu of the rolling process the French and German tanners finish their sole leather by hammering. Upper leather and calf skins are tanned by nearly the same modes as sole leather, only in finishing they are rubbed smooth with stones before the oil, tallow and blacking are applied. These being sold by the side or piece, the plumping and filling with tannic acid, to the extent required in tanning sole leather, is unnecessary.



EAGLE VALLEY TANNERY, RIDGWAY.



TUNKHANNOCK TANNERY.

The tanning materials of the United States are being rapidly exhausted by the large number of tanneries now in operation. The large forests of hemlock timber that made Sullivan, Ulster and the adjoining counties of the State of New York so famous as the Eden of tanners a few years ago, have disappeared under the blows of the sturdy bark peelers, and the tanneries in that region are only known by their ruins. The highest prices offered and the great demand for leather during the war with the south, and for some years subsequent to its close, inspired a wonderful degree of activity on the part of the tanners, and the amount of leather produced was limited only by the extreme capacity of the tanneries. This soon exhausted the local supply of bark and compelled the tanners to look elsewhere for the needful. Then came the migration of tanners into central and northern Pennsylvania. The Kistlers, the Osterhouts, the Schultzes, the Hortons, the Hoyts, the Grants and many others who have made the old tanning fields famous, now entered the magnificent forests of hemlock and oak timber in Pennsylvania. In all directions where the wild deer had been dwelling in peace, the sound of the axeman's blows and of the falling timber was to be heard. At first the supply appeared so inexhaustible that less care was exercised in peeling and preserving the bark than should have been. Much of the timber from which the bark had been peeled was allowed to lie where it fell and decay. This delusion has evaporated, and the tanners begin to see the end of the supply, and are casting about for new territory. Whither will they go to find it? Is it possible that the vast belt of hemlock timber, extending from Hudson's Bay westward across the continent to the Pacific slope, will entice them into the Queen's dominions, and the United States tanners become subjects of Great Britain? It is true that in portions of the western states, notably Michigan and Wisconsin, are to be found limited supplies of hemlock timber. But when compared either in quality or quantity with the Pennsylvania forests before the bark peelers came, they sink into utter insignificance.

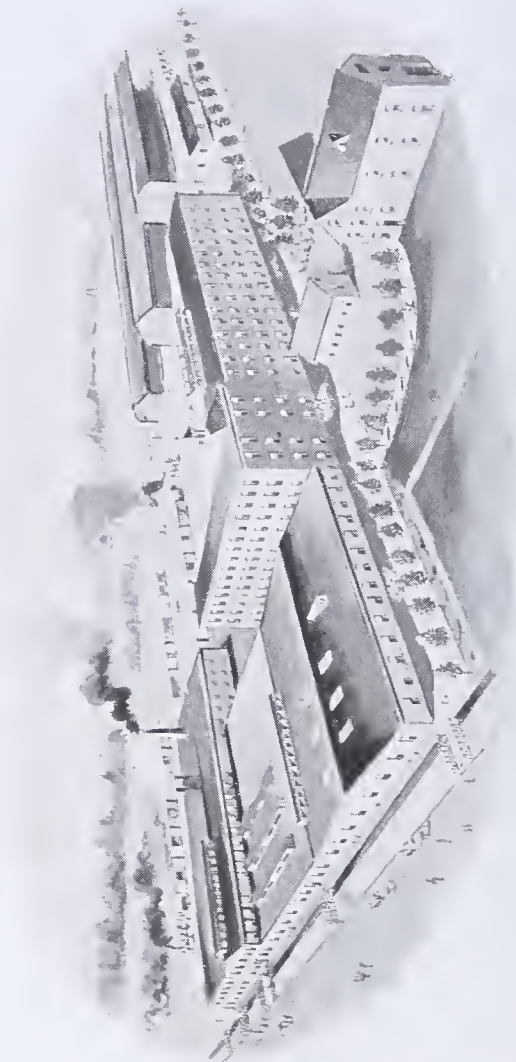
There appears to be no way to reproduce the hemlock forest. First, because it requires so long a time for a hemlock tree to become of value as a bark producer, for many of the trees which made up the grand forests in Pennsylvania, when the tanner appeared on the scene, were saplings when Columbus planted the crucifix and unfurled the Spanish colors on American shores; and, finally, because no plan of germinating the seeds of hemlock, if such there be, has been devised or discovered by human ingenuity. It is a fact that cannot be gainsaid, that where the hemlock timber has been felled, either by the axeman or by the cyclone, hard wood timbers, if any, spring up to take its place. There may be exceptions to this rule, but if there be, the writer, after long years and a wide range of experience, is compelled to declare that he has not discovered any of them. With the oak tanners there is a some-

what better prospect in view, for the chestnut oak tree reproduces itself. When the parent tree is felled, sprouts start from the roots, and if care be taken to prevent the fires destroying the young shoots, a new forest of oak timber will replace the old one in a comparatively few years. In France and Germany the experiment has been made, and the result is that a new forest of oak is produced, and a fair crop of bark obtained, once in from ten to thirteen years. If American tanners of oak leather should stand between their peeled friends and the fire vandals, be they the farmer intent only on clearing a "patch," the railroad locomotive without a hood, or the tramp provided with matches, as their French and German brethren do, they would reap a valuable reward. To some extent the same may be said of the owners of the lands from which the hemlock timber has been removed. If the fire fiend be kept at bay for a few years, the sparse hardwoods left standing, augmented by the new saplings that spring up, would re-clothe the hills and valleys with a growth of hardwood timber that must, in the march of events, soon become very valuable. How shall the owner of such timber be protected from the danger which thus besets him? Evidently a law making the farmer and railroad company liable for all damages done by fire which can be traced to them, and sending the tramp to state's prison, would aid some. However, much depends upon the owner's appreciation of the value of his possessions and the care and labor *he* bestows in protecting them.

Having completed our description of the methods of tanning, some statistics relating to the subject may be presented. In the census of 1880 the statistics of leather were presented under three classes, dressed skins, goods and tanneries. At that time the tanneries numbered 642, having a capital of \$15,680,635 and employing 5,580 persons, and preparing a product valued at \$27,042,068. The following table comprises all the statistics relating to the industry that appeared in the census of 1880:

STATISTICS OF LEATHER, 1880.

	Number of establishments.	Capital.	AVERAGE NUMBER OF HANDS EMPLOYED.			Total amount paid in wages during the year.	Value of materials	Value of product.
			Males above sixteen years.	Females above fifteen years.	Children and youths.			
Leather, Dressed skins, . . .	57	\$2,619,347	2,121	103	88	\$1,183,898	\$4,971,982	\$6,859,044
Leather goods,	1	15,000	25	..	..	5,350	9,000	36,000
Leather, Tanned,	642	515,608,63	5,541	12	39	1,967,946	19,716,236	27,042,068
Totals,	700	\$18,342,982	7,687	115	128	\$3,157,194	\$24,697,218	\$33,937,112



J. W. & A. P. HOWARD, CORRY.



QUEEN CITY TANNERY, PITTSVILLE.

In 1890 another census was taken. Statistics were collected from 420 tanneries, a diminution of 222 during the ten years, or on an average, more than 20 a year. The most of these tanneries were of small size, and a large number of them were closed because their supply of bark was exhausted. Some tanneries, however, during this period have greatly increased in size so that the total product is larger than it was ten years ago.

In 1892, two years after the national census was taken, the bureau collected statistics of this industry. A portion of the field of inquiry covered by the national census was omitted, while investigations were made in other directions by the bureau not covered by the national census. These related especially to the acreage owned by the tanneries and the quantity of bark annually prepared for tanning purposes. It appears that the acreage of the tanneries owned at the time of establishing them, or since acquired, is 749,017, a quantity of land larger than Bradford county, and nearly three times as large as many of the counties of the state. From these figures one will form some conception of the enormous domain owned by the tanners, and which either has been or will be exhausted for tanning purposes.

Leaving this subject, some comparisons may be made of the figures in the two reports respecting the values of the buildings, machinery, etc., owned by the tanneries. The number of tanneries from which returns were obtained by the bureau was 358, a diminution, it may be noticed, of 62 since the taking of the national census. This seems a very large decline in number during the short period of two years, but the investigation made by the state bureau was personal in all parts of the state, and no tanneries have been omitted. We must, therefore, conclude that more than sixty tanneries have been closed during this period. The principal reason for closing them doubtless was the exhaustion of bark lands. All of them, however, were very small, employing only two or three persons.

Notwithstanding the smaller number of tanneries from which state returns were obtained, the value of the buildings connected with the operation of the plant was \$7,658,733, while the value given for the larger number by the national census was \$4,288,186. The value of the machinery, tools, etc., as ascertained by the bureau was \$3,747,882, while their value in the national census is \$2,106,437.

The figures respecting the value of land may be next presented. By the returns of the bureau the value of the bark lands is \$11,383,920, while the value of other lands from which bark has been taken is \$437,282. The value of all the lands given by the national census is only \$2,074,799, which however, so the bureau has been informed by the superintendent of the census, is only of land occupied by the tanneries. The value of their bark lands, therefore, is excluded. No reason is given for excluding the much larger item of bark lands, while including the

lands occupied by the buildings. The area of the bark lands still unexhausted is 483,309 acres, possessing an average value of about \$23.55 per acre. That such an important item of property should have been excluded from the census is indeed singular, and especially without any explanation. Was the omission accidental? Did not the census office know of this important item of property?

In the national census, however, the lands covered by the tanneries and used in connection with them is valued at \$2,074,799. The total of land and buildings by the census valuation is \$6,362,985, which is \$1,322,748 less than the bureau valuation.

With respect to the number of men employed the bureau figures are 13,540, while those of the national census are 11,647, or 1,893 less. The bureau cannot account for this discrepancy. Besides this number, 8,425 are employed during the bark-peeling season, of whom no account is taken in the national census. Of the number thus employed, 111 tanneries employ less than 5 men; 43 tanneries between 5 and 10 men; 63 tanneries between 10 and 25 men; 46 tanneries between 25 and 50; 53 tanneries between 50 and 100 men and 42 tanneries employ more than 100 men.

A very general explanation may be given for the existence of so many small tanneries. In the early days of the industry many of them tanned skins for the farmers and butchers in their locality on shares. Their business, therefore, was almost wholly local. Other and much larger tanneries, however, have been established. As the bark supply of late years has become scarce in many places the small tanneries located in them have closed, and probably within ten years all the small ones known as "custom tanneries," will retire from business.

A summary of some of the more important results of the national census may now be given. The capital invested was \$21,717,257, the wages paid were \$5,484,074, the cost of the principal materials used was \$33,864,986, and the value of their product was \$48,695,179. A large quantity of bark is also annually prepared and transported to tanneries outside the state; no account has been taken of the quantity thus sent away. The summary of the investigation by the state bureau is as follows:

Number acres of hemlock bark land owned at the time of the establishment of the plant.	203,525	Average annual consumption of hemlock bark for the last five years.	697,106
Number acres of hemlock bark land since acquired.	545,492	Average price paid per cord for hemlock bark for the last five years. . .	\$5 59
Total acreage of hemlock bark land owned during history of plant. . .	749,017	Price paid per cord for hemlock bark during the year ending January 1, 1892.	\$5 93
Number acres of hemlock bark land now owned from which bark has not been taken.	483,309	Number of cords of oak bark on hand January 1, 1892.	106,587
Number of cords of hemlock bark on hand January 1, 1892.	595,964	Number of cords of oak bark consumed from January 1, 1891, to January 1, 1892.	160,622
Number of cords of hemlock bark consumed from January 1, 1891, to January 1, 1892.	771,717	Average annual consumption of oak bark for the last five years.	155,903

Average price paid per cord for oak bark for the last five years,	\$7 30	Valuation,	\$1,730,464 00
Price paid per cord for oak bark during the year ending January 1, 1892,	\$7 48	Number of sides of hemlock leather tanned,	6,488,026
Number of men employed in connection with the operation of plant for the year ending January 1, 1892,	13,540	Valuation,	\$19,164,969 00
Additional number employed during bark peeling season, including those employed by bark jobbers, . .	8,425	Number of sides of Union leather tanned,	2,747,684
Value of buildings, tenement houses, yards and grounds immediately connected with the operations of the plant,	\$7,685,733 00	Valuation,	\$9,792,844 00
Value of machinery, engines, boilers, connections, tools, implements and apparatus, including railroads and other means of transporting bark,	\$3,747,882 00	Number of sides of upper leather tanned,	612,860
Total value of land from which bark has not been taken,	\$11,383,920 00	Valuation,	\$1,793,139 00
Total value of land from which bark has been taken,	\$437,282 00	Number of sides tanned for all other purposes,	868,034
Total valuation,	\$20,553,456 00	Valuation,	\$3,203,220 00
Number of sides of belting leather tanned,	378,624	Number of calf and kip skins tanned,	541,548
Valuation,	\$1,876,498 00	Valuation,	\$951,957 00
Number of sides of grain leather tanned,	43,000	Number of goat skins tanned,	16,443,641
Valuation,	\$62,500 00	Valuation,	\$12,813,145 00
Number of sides of harness leather tanned,	444,372	Number of sheep skins tanned, . . .	1,113,105
Valuation,	\$2,099,803 00	Valuation,	\$560,180 00
Number of sides of oak leather tanned,	409,817	Number of splits tanned,	207,000
		Valuation,	\$137,700 00
		Valuation of all other products, . .	\$1,102,559 00
		Total valuation,	\$55,288,978 00
		Number of barrels of hemlock bark extract manufactured during year ending January 1, 1892,	35,900
		Valuation,	\$466,500 00
		Number of barrels of oak bark extract manufactured during year ending January 1, 1892,	16,600
		Valuation,	\$212,650 00
		Total valuation of all extracts manufactured,	\$679,150 00

LEATHER, TANNED

		CAPITAL			
		VALUE OF PLANT.			
COUNTY.	Number of establishments.	Land.	Buildings.	Machinery, tools and implements.	Total.
1 Adams,	7	\$2,400	\$10,600	\$2,175	\$15,175
2 Allegheny,	16	304,400	477,900	204,943	987,243
3 Armstrong,	6	3,350	3,450	2,400	9,200
4 Bedford,	8	7,550	73,405	28,500	59,455
5 Berks,	15	21,050	30,300	13,000	64,350
6 Blair,	4	20,650	33,300	1,400	55,350
7 Bradford,	8	11,155	65,150	42,525	118,830
8 Cambria,	4	5,050	17,700	8,300	31,050
9 Cameron,	3	157,000	140,000	59,000	356,000
10 Centre,	5	3,750	23,700	17,500	44,950
11 Clearfield,	6	43,600	172,000	54,500	270,100
12 Clinton,	5	17,150	83,400	28,650	129,200
13 Crawford,	7	19,200	57,500	40,450	117,150
14 Columbia,	4	1,550	4,650	1,650	7,850
15 Cumberland,	8	3,875	27,500	6,800	38,175
16 Dauphin,	14	15,350	30,600	11,745	57,695
17 Elk,	6	350,696	489,470	241,750	1,081,916
18 Erie,	11	23,725	56,060	30,000	109,785
19 Fayette,	4	350	2,500	900	3,750
20 Franklin,	9	4,270	18,820	2,910	26,000
21 Fulton,	6	13,460	7,400	2,400	23,260
22 Greene,	4	850	2,500	505	3,855
23 Huntingdon,	8	4,700	50,200	17,820	72,720
24 Indiana,	7	2,700	5,700	4,175	12,575
25 Jefferson,	7	10,775	49,400	21,955	82,130
26 Juniata,	4	2,100	14,700	2,900	19,700
27 Lancaster,	13	12,900	75,300	23,540	111,740
28 Lebanon,	3	650	2,000	2,550	5,200
29 Lehigh,	15	11,750	41,750	13,405	66,905
30 Luzerne,	4	650	9,000	6,600	16,250
31 Lycoming,	15	272,000	273,850	67,763	613,613
32 McKean,	4	3,000	73,256	51,967	128,223
33 Mifflin,	4	2,700	33,100	2,225	38,025
34 Monroe,	4	12,500	37,800	24,250	74,550
35 Montgomery,	5	1,300	8,800	3,650	13,750
36 Northampton,	6	8,800	17,200	5,850	31,850
37 Northumberland,	5	22,220	41,500	22,400	86,120
38 Perry,	8	18,425	94,500	23,862	136,787
39 Philadelphia,	53	214,700	696,500	558,107	1,469,307
40 Potter,	4	14,500	106,000	49,500	170,000
41 Schuylkill,	6	2,850	13,000	3,600	19,450
42 Snyder,	3	950	9,600	1,450	12,000
43 Somerset,	4	525	1,150	390	2,065
44 Sullivan,	4	18,600	93,300	53,050	164,950
45 Susquehanna,	5	2,450	25,750	17,200	45,400
46 Tioga,	16	219,133	301,500	182,900	703,533
47 Union,	5	1,650	4,400	2,100	8,150
48 Warren,	10	52,950	187,000	65,050	305,000
49 Wayne,	3	36,500	42,000	25,500	104,000
50 Westmoreland,	3	1,300	7,300	1,095	9,695
51 Wyoming,	3	30,500	61,500	10,500	102,500
52 York,	12	18,420	19,625	10,070	48,115
Total for counties having three or more establishments,		\$2,032,629	\$4,174,586	\$2,077,427	\$8,284,642
Total for all other counties,		42,170	113,600	29,010	184,780
Total for state,		\$2,074,799	\$4,288,186	\$2,106,437	\$8,469,422

AND CURRIED.*

INVESTED.

LIVE ASSETS.				Value of property hired.	Aggregate capital.
Raw materials.	Stock in process and finished products.	Cash, bills receivable, accounts receivable and all sundries not otherwise reported	Total.		
\$5,000	\$11,050	\$5,810	\$21,860	\$1,400	\$37,035
175,650	895,851	653,237	1,724,738	2,000	2,711,981
1,570	1,180	567	3,317		12,517
108,700	123,160	20,390	252,250		311,705
23,320	99,100	17,000	139,420	16,150	203,770
810	83,155	53,235	137,200		192,550
113,695	350,886	53,690	518,271		637,101
2,950	10,400	4,150	17,500		48,550
70,000	276,000	14,200	360,200		716,200
25,400	214,750	3,516	243,666		288,616
149,000	983,968	194,672	1,327,640		1,597,740
72,948	323,876	38,608	435,432		564,632
53,200	95,750	44,100	193,050		310,200
600	4,900	2,500	8,000	800	15,850
6,150	32,300	3,800	42,250	1,000	80,425
16,757	55,418	46,453	118,628	2,950	176,323
162,806	997,805	419,385	1,579,996	3,200	2,661,912
36,578	122,871	52,514	211,963		321,748
2,200	1,900		4,100	1,200	7,850
5,690	26,970	6,950	39,610		65,610
2,140	27,040	10,555	39,735		62,995
750	5,750	400	6,900		10,755
123,270	305,504	10,242	439,016		511,736
10,357	16,080	6,250	32,687		45,262
24,210	64,340	42,928	131,478		213,608
10,100	16,630	16,900	43,630		63,330
24,937	171,850	66,300	263,087	14,300	374,827
2,900	5,712	3,810	12,422	1,100	17,622
33,975	158,800	27,300	220,075	9,600	236,980
3,300	25,000	3,200	31,500		47,750
108,104	872,735	165,525	1,146,364	5,500	1,759,977
127,605	462,090	212,833	802,528		930,751
24,803	91,952	18,372	135,127		173,152
20,190	189,530	12,001	221,721		295,271
5,950	36,200	9,864	52,014	1,100	65,764
14,368	36,034	6,800	57,202	900	89,052
37,724	253,115	4,749	295,588		381,708
47,935	335,900	276,225	660,060		796,847
722,613	2,091,124	1,144,906	3,958,643	213,247	5,427,950
193,355	376,520	122,110	691,985		861,985
4,000	63,050	11,200	78,250	1,700	97,700
4,000	44,600	1,200	49,800		61,800
640	2,000	800	3,440		5,505
200,040	315,070	10,150	525,260		630,210
17,730	76,845	26,457	121,032		166,432
457,889	1,357,739	197,271	2,012,899		2,716,432
2,125	11,800	3,400	17,325	1,900	25,475
254,200	630,882	406,209	1,291,291		1,596,291
28,100	100,050	26,000	154,150		258,150
1,360	10,020	5,260	16,640		26,335
58,000	161,000	10,000	209,000		311,500
23,080	82,350	23,720	129,150	3,100	177,265
\$3,602,774	\$13,108,602	\$4,517,714	\$21,229,090	\$281,147	\$29,513,732
114,092	348,028	26,047	488,167	10,000	672,947
\$3,716,866	\$13,456,630	\$4,543,761	\$21,717,257	\$291,147	\$30,186,679

* These are the national census returns.

LEATHER, TANNED

	COUNTY.	Number of establishments.	MISCELLANEOUS EXPENSES.				
			Rent.	Power and heat.	Taxes.	Insurance.	Repairs, ordinary, of buildings and machinery.
1	Adams.	7	\$120	\$200	\$206	\$132	\$170
2	Allegheny.	16	200		9,549	19,233	7,799
3	Armstrong.	6			95	36	100
4	Bedford.	8		330	476	5,335	2,134
5	Berks.	15	975		554	1,191	1,767
6	Blair.	4		13	233	2,015	2,060
7	Bradford.	8			3,791	9,400	2,200
8	Cambria.	4			661	671	180
9	Cameron.	3			2,421	2,610	8,500
10	Centre.	5			467	1,359	1,271
11	Clearfield.	6			3,949	8,292	17,195
12	Clinton.	5			1,463	2,479	2,421
13	Crawford.	7	75		1,774	2,582	2,050
14	Columbia.	4	100		55	57	27
15	Cumberland.	8	295		202	482	200
16	Dauphin.	14	200		550	983	1,221
17	Elk.	6			11,339	9,555	19,177
18	Erie.	11			1,032	2,730	3,875
19	Fayette.	4	125		38	12	10
20	Franklin.	9		30	288	302	375
21	Fulton.	6			338	421	579
22	Greene.	4			50	18	95
23	Huntingdon.	8			1,026	1,619	3,540
24	Indiana.	7			140	125	394
25	Jefferson.	7			879	2,996	9,432
26	Juniata.	4			113	755	625
27	Lancaster.	13	1,234		589	1,506	2,225
28	Lebanon.	3	275		210	240	170
29	Lehigh.	15	600		457	1,854	1,334
30	Luzerne.	4			125	360	500
31	Lycoming.	15	100		8,961	8,946	17,371
32	McKean.	4			1,364	4,022	13,527
33	Mifflin.	4			163	858	1,368
34	Monroe.	4			558	1,565	6,500
35	Montgomery.	5	160		126	415	1,000
36	Northampton.	6	90		146	249	325
37	Northumberland.	5			812	1,821	850
38	Perry.	8			933	2,052	3,125
39	Philadelphia.	53	58,166	125	13,023	24,463	21,243
40	Potter.	4			1,538	3,892	2,800
41	Schuylkill.	6	100		165	446	215
42	Snyder.	3			140	10	100
43	Somerset.	4			24	27	35
44	Sullivan.	4			2,425	3,570	17,300
45	Susquehanna.	5			487	1,062	2,119
46	Tioga.	16			7,242	17,570	38,686
47	Union.	5	200		63	82	60
48	Warren.	10			4,731	7,990	19,000
49	Wayne.	3			3,474	2,187	3,050
50	Westmoreland.	3			102	105	16
51	Wyoming.	3			521	1,100	2,600
52	York.	12	255	25	422	290	1,617
Total for counties having three or more establishments.			\$63,250	\$723	\$98,490	\$162,073	\$244,518
Total for all other counties.			1,000	400	2,286	2,809	6,567
Total for state.			\$64,250	\$1,123	\$99,776	\$164,882	\$251,085

AND CURRIED—Continued.

EXPENSE ITEMS.			Average annual allowance since June 1, 1889 for depreciation of buildings and machinery.	SUMMARY OF LABOR AND WAGES IN ALL CLASSES—(Including Piece Work)	
Interest on cash used in this business.	Amount paid for sundries not elsewhere reported.	Total.		MALES ABOVE SIXTEEN YEARS.	
				Total number employed.	Total wages paid.
\$12	\$70	\$910	\$105	19	\$8,208
47,360	27,191	111,332	9,000	967	514,843
116	116	347	110	14	6,994
13,280	220	21,775	1,875	166	67,876
2,265	225	6,977	1,120	86	30,878
28,283	7,050	11,371	110	58	34,534
48	7,814	51,488	2,110	198	87,111
12,988	300	1,860	50	27	12,101
2,871	30	26,519	2,900	173	83,052
30,647	40,397	100,480	11,326	76	35,553
4,463	22,114	32,940	2,450	514	254,186
1,898	2,550	10,329	200	156	69,891
210	50	499	100	221	55,418
1,550	800	3,529	650	11	4,576
1,945	44	4,943	515	28	8,692
36,764	41,859	118,694	22,000	83	30,370
2,120	1,370	11,127	4,125	696	309,928
530	103	185	15	94	43,671
300	425	1,628	250	8	2,425
149	50	2,063	200	25	9,093
718	37	312	10	23	7,586
650	7,375	6,953	310	5	1,314
2,170	425	1,346	127	149	58,097
150	368	22,852	10,808	34	16,870
2,456	60	2,068	550	197	83,609
85	5,550	8,372	320	23	8,825
1,185	370	1,040	265	135	56,778
993	3,623	10,980	759	17	5,590
13,163	950	1,355	1,050	92	44,485
144	1,979	39,994	2,720	25	9,590
1,800	950	32,076	1,500	543	246,263
190	55	4,512	900	574	233,707
625	10	11,373	500	36	14,292
14,816	4,620	1,946	100	166	61,855
3,229	5,700	1,445	2,459	24	10,970
9,460	30,800	22,919	1,200	47	23,685
6,050	350	15,030	23,200	112	56,780
405	50	14,280	3,700	113	58,625
111	25	1,681	200	2,837	1,582,969
2,000	2,300	300	50	337	149,503
1,179	115	222	55	31	10,747
6,047	22,068	27,595	920	16	6,970
20	73	4,954	16,774	5	1,502
26,884	5,000	91,608	725	215	101,978
6,000	1,000	498	6,400	118	44,933
50	25	63,605	5,000	822	361,752
480	364	15,711	210	10	3,446
		292	41	583	267,804
		4,221	68	81	35,824
		3,433	441	8	3,307
				98	42,500
				68	28,582
\$289,098	\$245,695	\$1,095,847	\$140,455	11,160	\$5,318,141
44,262	14,186	71,510	6,950	287	120,715
\$333,360	\$259,881	\$1,167,357	\$147,405	11,447	\$5,438,856

LEATHER, TANNED

COUNTY.		Number of establishments.	SUMMARY OF LABOR AND WAGES IN ALL CLASSES— (Including Piece Work).						
			FEMALES ABOVE FIFTEEN YEARS.		CHILDREN.		Aggregate number of hands employed.	Aggregate wages paid.	
			Total number em- ployed.	Total wages paid.	Total number em- ployed.	Total wages paid.			
1	Adams.	7					19	\$8,208	
2	Allegheny.	16					967	514,843	
3	Armstrong.	6					14	6,994	
4	Bedford.	3					166	67,876	
5	Berks.	15	1	\$150	1	\$60	88	40,088	
6	Blair.	4					58	34,534	
7	Bradford.	9					198	87,111	
8	Cambria.	4					27	12,104	
9	Cameron.	3					172	83,052	
10	Centre.	5					73	35,553	
11	Clearfield.	6					514	254,186	
12	Clinton.	5					156	69,891	
13	Crawford.	7					221	55,418	
14	Columbia.	4					11	4,576	
15	Cumberland.	8					28	8,692	
16	Dauphin.	14			4	326	87	30,696	
17	Elk.	6	1	600	2	260	690	310,788	
18	Erie.	11					94	43,677	
19	Fayette.	4					8	2,425	
20	Franklin.	9					25	9,093	
21	Fulton.	6					23	7,586	
22	Greene.	4					5	1,314	
23	Huntingdon.	8					149	58,097	
24	Indiana.	7					34	16,870	
25	Jefferson.	7					197	83,609	
26	Juniata.	4			1	75	24	8,900	
27	Lancaster.	13					135	55,778	
28	Lebanon.	3					17	5,590	
29	Lehigh.	15			1	75	93	44,560	
30	Luzerne.	4					25	9,590	
31	Lycoming.	15			6	1,350	549	247,613	
32	McKean.	4			13	1,950	587	235,657	
33	Mifflin.	4					36	14,292	
34	Monroe.	4					166	61,855	
35	Montgomery.	5					24	10,970	
36	Northampton.	6	1	364			48	24,049	
37	Northumberland.	5					112	56,780	
38	Perry.	8					113	58,625	
39	Philadelphia.	53	26	11,993	142	27,895	3,005	1,622,857	
40	Potter.	4					337	149,503	
41	Schuylkill.	6					31	10,747	
42	Snyder.	3					16	6,970	
43	Somerset.	4					5	1,502	
44	Sullivan.	4					215	101,978	
45	Susquehanna.	5					118	44,933	
46	Tioga.	16					822	361,752	
47	Union.	5					10	3,446	
48	Warren.	10					583	267,804	
49	Wayne.	3					81	35,824	
50	Westmoreland.	3					8	3,307	
51	Wyoming.	3					98	42,500	
52	York	12					68	28,582	
Total for counties having three or more establishments, . . .			403		170	\$31,991	11,359	\$5,363,239	
Total for all other counties, . .			17		1	120	288	120,835	
Total for state,			420	29	\$13,107	171	\$32,111	11,647	\$5,484,074

AND CURRIED—Continued.

MATERIALS USED.					GOODS MANUFACTURED.		
Cost of principal ma- terials used.	Cost of fuel.	Cost of mill supplies.	Cost of all other ma- terials.	Total cost of all ma- terials.	Value of principal product.	Value of all other products, including receipts for custom work and repairing.	Total value of all products.
\$38,883	\$512	.. . . .	\$700	\$40,095	\$55,723	\$700	\$56,423
4,355,672	4,105	.. . . .	5,315	4,365,092	5,374,698	126,642	5,500,740
49,320	368	.. . . .	102	49,790	59,669	136	59,805
651,594	2,555	\$25	2,400	656,574	853,338	11,225	864,563
243,175	1,004	.. . . .	503	244,682	315,832	2,904	318,736
171,927	30	.. . . .	.. . . .	171,977	255,555	1,000	256,555
748,792	505	.. . . .	425	749,722	1,109,650	237	1,109,887
87,882	323	.. . . .	.. . . .	88,205	116,531	.. . . .	116,531
497,059	.. . . .	.. . . .	1,225	498,284	682,881	4,500	687,381
409,334	290	.. . . .	10	409,634	510,835	100	510,935
1,780,232	1,400	.. . . .	4,538	1,786,170	2,849,747	28,311	2,878,058
598,332	16	.. . . .	1,000	599,348	843,419	9,580	852,999
351,163	1,715	350	3,300	356,528	514,972	200	515,172
20,100	90	.. . . .	60	20,250	27,475	800	28,275
61,769	355	.. . . .	210	62,334	94,213	.. . . .	94,213
216,356	145	.. . . .	156	216,657	295,899	1,569	297,468
1,801,463	405	.. . . .	11,455	1,813,323	2,824,925	.. . . .	2,824,925
301,160	3,421	255	.. . . .	304,836	446,582	109	446,691
6,120	35	.. . . .	.. . . .	6,155	9,470	.. . . .	9,470
46,662	307	40	130	47,139	63,784	200	63,984
58,188	50	.. . . .	.. . . .	58,238	145,391	.. . . .	145,391
5,140	30	.. . . .	20	5,190	9,745	190	9,935
787,818	264	.. . . .	50	788,132	916,243	.. . . .	916,243
91,441	350	.. . . .	230	92,021	120,932	.. . . .	120,932
486,539	650	30	50	487,269	684,981	100	685,081
49,102	200	.. . . .	50	49,352	72,465	.. . . .	72,465
454,652	197	.. . . .	415	455,264	588,536	200	588,736
25,526	265	.. . . .	.. . . .	25,791	36,938	689	37,627
316,856	195	.. . . .	360	317,411	430,935	100	431,035
57,039	150	35	.. . . .	57,224	84,100	.. . . .	84,100
2,432,279	145	.. . . .	228	2,432,652	3,100,415	170	3,100,585
1,103,624	1,350	.. . . .	3,904	1,108,878	1,579,400	17,000	1,596,400
161,605	.. . . .	.. . . .	.. . . .	161,605	207,550	.. . . .	207,550
385,722	.. . . .	300	.. . . .	386,022	580,684	2,160	582,844
37,496	90	100	.. . . .	37,686	57,723	40	57,763
140,710	735	.. . . .	.. . . .	141,445	185,412	.. . . .	185,412
336,602	451	.. . . .	1,500	338,553	467,705	38	467,743
510,759	735	20	750	512,264	751,775	14,125	765,900
6,175,740	32,220	.. . . .	72,545	6,280,505	9,710,499	24,400	9,734,899
980,950	1,300	.. . . .	6,200	988,450	1,545,000	.. . . .	1,545,000
63,562	562	.. . . .	.. . . .	64,124	94,085	50	94,135
37,206	45	.. . . .	.. . . .	37,251	52,260	.. . . .	52,260
6,664	3	.. . . .	.. . . .	6,667	9,544	.. . . .	9,544
731,085	.. . . .	.. . . .	.. . . .	731,085	1,074,942	.. . . .	1,074,942
210,125	625	.. . . .	75	210,825	304,535	.. . . .	304,535
2,602,361	780	.. . . .	6,048	2,609,189	3,479,485	.. . . .	3,479,485
25,364	75	.. . . .	503	25,942	37,493	96	37,589
1,565,371	885	1,000	94,000	1,661,256	2,452,600	.. . . .	2,452,600
318,450	.. . . .	.. . . .	.. . . .	318,450	412,300	.. . . .	412,300
17,056	362	.. . . .	.. . . .	17,418	27,730	.. . . .	27,730
367,900	.. . . .	.. . . .	.. . . .	367,900	591,000	.. . . .	591,000
136,365	465	.. . . .	1	136,831	204,365	3,500	207,865
\$33,116,292	\$60,780	\$2,155	\$218,458	\$33,397,685	\$47,321,366	\$251,071	\$47,572,437
748,694	1,617	25	5,638	755,974	1,122,042	700	1,122,742
\$33,864,986	\$62,397	\$2,180	\$224,096	\$34,153,659	\$48,443,408	\$251,771	\$48,695,179

TANNING

COUNTY.	Number of tanneries and extract works.	Number acres of hemlock bark land owned at time of the establishment of the plant.	Number acres of hemlock bark land since acquired.	Total acreage of hemlock bark land owned during history of plant.
Adams,	8	.	.	.
Allegheny,	18	.	.	.
Armstrong,	3	.	.	.
Bedford,	12	.	.	.
Berks,	14	.	.	.
Bradford,	7	6,500	20,300	26,800
Cambria,	6	400	.	400
Cameron,	3	10,000	10,115	20,115
Centre,	4	.	.	.
Chester,	2	.	.	.
Clearfield,	8	.	33,500	33,500
Clinton,	4	.	20,000	20,000
Columbia,	8	.	.	.
Crawford,	5	.	.	.
Cumberland,	6	.	.	.
Dauphin,	8	.	.	.
Elk,	7	50,800	46,477	97,277
Erie,	9	.	.	.
Fayette,	2	.	.	.
Forest,	4	4,000	12,000	16,000
Franklin,	9	.	.	.
Fulton,	3	.	.	.
Huntingdon,	8	.	.	.
Indiana,	5	.	.	.
Jefferson,	3	.	5,000	5,000
Juniata,	4	.	.	.
Lancaster,	8	.	.	.
Lebanon,	3	.	.	.
Lehigh,	9	.	.	.
Luzerne,	2	.	.	.
Lycoming,	9	27,000	83,913	110,913
McKean,	6	5,200	27,300	32,500
Mifflin,	3	.	.	.
Monroe,	2	.	.	.
Montgomery,	4	.	.	.
Northampton,	4	.	.	.
Northumberland,	4	.	.	.
Perry,	7	.	.	.
Philadelphia,	46	.	.	.
Potter,	6	16,000	59,300	75,300
Schuylkill,	3	.	.	.
Snyder,	3	.	.	.
Somerset,	8	.	.	.
Sullivan,	3	28,000	39,014	67,014
Susquehanna,	4	100	433	533
Tioga,	15	42,000	76,140	118,140
Union,	4	.	.	.
Warren,	11	5,500	89,200	94,700
Wayne,	2	8,000	22,000	30,000
Wyoming,	4	.	.	.
York,	10	.	.	.
Miscellaneous,	9	25	800	825
Total,	358	203,525	545,492	749,017

INDUSTRY.*

Number acres of hemlock bark land now owned from which bark has not been taken.	Number of cords of hemlock bark on hand January 1, 1892.	Number of cords of hemlock bark consumed from January 1, 1891, to January 1, 1892.	Average annual consumption of hemlock bark for the last five years (cords).	Average price paid per cord for hemlock bark for the last five years.	Price paid per cord for hemlock bark during the year ending January 1, 1892.	Number of cords of oak bark on hand January 1, 1892.	Number of cords of oak bark consumed from January 1, 1891, to January 1, 1892.
	4,710	13,450	13,487	\$7 24	\$7 28	700	950
	50	390	390	7 50	7 00	17,400	38,100
	220	258	222	7 49	7 90	75	505
26,600	35,600	31,800	26,600	5 97	6 21	16,118	22,372
300	3,930	2,475	2,480	4 38	4 67	1,930	3,025
4,770	19,500	21,000	19,644	5 40	5 42	735	460
	4,989	7,952	7,893	5 12	5 31	400	895
						795	350
31,500	44,870	60,000	59,312	5 12	5 09	390	1,109
16,000	14,050	19,293	19,355	5 44	5 53	9,665	3,700
		24	30	4 11	5 00	2,797	2,395
	13,986	15,100	15,309	4 96	5 87	415	454
						50	50
	260	250	140	6 25	6 17	595	1,285
81,477	77,635	83,038	74,648	5 42	5 79	1,695	2,135
	4,955	7,180	6,750	5 53	6 28	4,015	4,263
	425	330	330	6 71	7 00	65	50
12,000	21,000	29,500	29,125	5 06	5 56		
						1,931	3,008
	75	300	300	7 00	7 25	150	420
	180	350	440	3 30	4 00	4,651	23,436
5,000	21,000	11,375	9,100	4 40	4 50	505	710
						2,500	1,375
	370	965	954	7 86	7 75	1,630	2,450
	17	45	45	6 62	6 50	2,600	4,550
	2,500	5,511	5,511	7 24	7 65	710	825
	1,500	1,600	1,300	4 50	5 00	1,711	1,900
74,128	31,005	65,830	61,673	5 94	6 19	450	375
17,200	32,834	54,680	39,069	5 10	5 93	2,530	1,800
	600	1,040	920	5 75	6 63	670	150
	3,250	5,190	5,190	6 89	7 25	650	3,160
						750	850
						722	1,100
						330	900
	3,720	6,050	7,035	5 83	6 17	840	715
						5,575	9,575
						415	1,364
57,100	65,694	89,250	65,096	5 32	5 67		
	50	50	50	5 50	5 50	1,785	1,625
	10	20	15	4 00	4 00	1,360	1,580
	16	11	28	3 25	4 00	300	240
40,014	20,500	28,000	24,700	4 75	4 92		
	4,125	8,400	12,200	6 00	6 12		
63,220	84,148	94,512	79,510	5 55	6 14	1,000	825
	30	115	115	5 75	5 75	375	500
51,200	63,300	76,200	84,900	5 34	5 95		
2,000	5,000	4,300	5,220	5 50	6 00		
	5,610	16,353	8,500	5 25	5 88	3,115	2,134
						7,070	9,992
800	4,250	9,530	9,480	5 23	5 58	2,149	2,565
483,309	595,964	771,717	697,106	\$5 59	\$5 93	106,587	160,622

*The returns on these and the following pages were obtained by the Bureau.

TANNING

COUNTY.	Number of tanneries and extract works	Average annual consumption of oak bark for the last five years (cords).	Average price paid per cord for oak bark for the last five years.	Price paid per cord for oak bark during the year ending January 1, 1892.
Adams,	8	880	\$7 16	\$7 16
Allegheny,	18	35,040	10 05	10 05
Armstrong,	3	485	7 00	6 83
Bedford,	12	19,863	6 40	6 48
Berks,	14	2,670	8 22	8 60
Bradford,	7	375	7 20	7 30
Cambria,	6	905	5 75	7 25
Cameron,	3	350	7 00	7 00
Centre,	4	869	6 75	6 84
Chester,	2	350	9 75	10 00
Clearfield,	6	3,705	7 45	7 72
Clinton,	4	2,645	6 69	7 00
Columbia,	8	422	5 37	6 09
Crawford,	5	50	5 12	6 00
Cumberland,	6	1,325	7 33	7 25
Dauphin,	8	2,205	7 22	7 06
Elk,	7	4,105	8 80	9 00
Erie,	9	55	11 25	11 00
Fayette,	2			
Forest,	4			
Franklin,	9	3,250	5 99	5 97
Fulton,	3	550	4 67	4 67
Huntingdon,	8	23,062	6 36	6 36
Indiana,	5	885	5 75	6 20
Jefferson,	3	500	6 50	6 75
Juniata,	4	2,550	6 00	6 00
Lancaster,	8	4,668	8 81	9 02
Lebanon,	3	717	8 62	9 00
Lehigh,	9	2,066	7 66	7 94
Luzerne,	2	400	5 50	6 12
Lycoming,	9	2,068	7 50	7 37
McKean,	6	672	9 50	9 50
Mifflin,	3	2,930	7 25	7 67
Monroe,	2	1,050	7 00	7 00
Montgomery,	4	1,110	9 50	9 25
Northampton,	4	1,005	7 25	7 00
Northumberland,	4	3,225	7 31	6 58
Perry,	7	9,870	6 57	6 71
Philadelphia,	46	1,350	9 50	9 50
Potter,	6			
Schuylkill,	3	1,470	8 45	8 50
Snyder,	3	855	6 50	6 50
Somerset,	8	370	5 37	5 61
Sullivan,	5			
Susquehanna,	4			
Tioga,	15	750	8 50	9 00
Union,	4	485	6 56	6 44
Warren,	11			
Wayne,	2			
Wyoming,	4	2,200	6 88	7 63
York,	10	8,480	7 85	7 90
Miscellaneous,	9	3,066	6 64	7 79
Total,	358	155,903	\$7 30	\$7 48

INDUSTRY.

Number of men employed in connection with the operation of plant for the year ending January 1, 1892.	Additional number employed during bark peeling season, including those employed by bark jobbers.	Value of buildings, tenement houses, yards and grounds immediately connected with the operations of the plant.	Value of machinery, engines, boilers, connections, tools, implements and apparatus, including railroads and other means of transporting bark.	Total value of land from which bark has not been taken.	Total value of land from which bark has been taken.	Total valuation.	Number of sides of belting leather tanned.
18		\$22,000	\$4,400			\$26,400	
1,009	180	914,400	286,500			1,200,900	65,000
19	7	6,500	2,000			8,500	
220	44	94,925	33,825			128,750	217,678
146	12	103,500	27,700			131,200	
243		253,500	69,500	665,000	1,000	989,000	
77	64	73,500	16,300	5,400		95,200	
189	235	68,200	16,000	100,400	15,345	199,945	
71		20,800	9,000			29,800	
9		26,000	5,000			31,000	10
715	357	305,500	71,850	745,000	10,000	1,132,450	
153	200	97,000	61,000	400,000	20,000	578,000	18,200
13	2	12,875	1,270			14,145	
454	21	84,300	96,600			180,900	3,000
25		25,500	5,900			31,400	
52	1	43,300	7,750			51,050	
758	1,449	606,420	364,619	1,804,310	37,000	2,812,349	
79	9	68,000	21,500			89,500	
5		4,000	135,000			5,350	
245	215	105,000	170,000	240,000	6,000	521,000	
58		29,750	12,050			41,800	
5	30	9,600	1,500			11,100	
154		141,225	163,775			305,000	22,880
23	6	12,500	1,115			13,415	
260	311	103,900	32,000	200,000		335,900	
23		17,000	3,300			20,300	
123		106,500	23,550			103,050	
19		8,000	3,025			11,025	
63	2	57,500	10,600			68,100	
16		9,000	4,000			13,000	
513	775	266,000	80,000	1,756,560	51,925	2,154,485	
480	573	232,100	126,800	468,000	43,750	870,650	
41		27,000	7,000			34,000	10,000
100		35,000	23,000			58,000	
46		21,600	3,900			25,500	
55		18,000	4,700			22,700	
62	74	40,500	18,650			59,150	
75	20	58,700	14,100			72,800	10,656
3,738		1,776,500	812,600			2,589,100	
745	570	355,000	180,000	1,339,400	24,500	1,898,900	
21		6,500	4,200			10,700	
20		8,000	2,200			10,200	16,640
11		9,000	360			9,360	
265	230	185,000	60,000	1,000,350	63,000	1,308,350	
151	93	44,334	21,666		2,232	68,232	
836	2,145	357,500	160,000	1,571,500	65,800	2,154,800	
10		8,500	2,000			10,500	
675	649	456,500	582,000	1,024,000	67,500	2,130,000	
60	50	75,000	25,000	40,000	20,000	160,000	
140		156,000	42,000			198,000	
91	40	30,900	21,600			52,500	
101	61	88,104	29,027	24,000	9,230	150,361	14,560
13,540	8,425	\$7,685,733	\$3,747,882	\$11,383,920	\$437,282	\$23,254,817	378,624

TANNING

COUNTY.	Number of tanneries and extract works.	Valuation	Number of sides of grain leather tanned.	Valuation.
Adams,	8			
Allegheny,	18	\$325,000		
Armstrong,	3			
Bedford,	12	1,112,809		
Berks,	14			
Bradford,	7			
Cambria,	6			
Cameron,	3			
Centre,	4			
Chester,	2	60		
Clearfield,	8		18,000	\$30,000
Clinton,	4	91,000		
Columbia,	8			
Crawford,	5	17,000		
Cumberland,	6			
Dauphin,	8			
Elk,	7			
Erie,	9			
Fayette,	2			
Forest,	4			
Franklin,	9		25,000	32,500
Fulton,	3			
Huntingdon,	8	114,400		
Indiana,	5			
Jefferson,	3			
Juniata,	4			
Lancaster,	8			
Lebanon,	3			
Lehigh,	9			
Luzerne,	2			
Lycoming,	9			
McKean,	6			
Mifflin,	3	25,000		
Monroe,	2			
Montgomery,	4			
Northampton,	4			
Northumberland,	4			
Perry,	7	47,977		
Philadelphia,	4			
Potter,	6			
Schuylkill,	3			
Snyder,	3	77,876		
Somerset,	3			
Sullivan,	3			
Susquehanna,	4			
Tioga,	13			
Union,	4			
Warren,	11			
Wayne,	2			
Wyoming,	4			
York,	10			
Miscellaneous,	9	65,876		
Total,	358	\$1,876,498	43,000	\$62,500

INDUSTRY.

Number of sides of harness leather tanned.	Valuation.	Number of sides of oak leather tanned.	Valuation.	Number of sides of hemlock leather tanned.	Valuation	Number of sides of Union leather tanned.
5,490	\$16,470					
180,000	965,000	35,000	\$175,000			
2,800	9,300	1,800	4,300			
800	1,800	46,480	242,816			
8,800	39,200	25,600	68,450			
				405,600	\$1,428,960	163,000
13,400	60,550	1,220	2,180			55,350
				255,000	612,500	78,000
3,400	11,400					110,292
6,000	29,250					
		84,595	250,000			483,606
1,000	3,000					198,000
2,675	7,275					
				25,000	100,000	
9,200	39,400					
26,700	97,450	5,360	10,720			
				582,069	1,532,468	475,232
4,620	17,750			27,000	107,000	18,400
4,400	12,000	17,586	65,569	294,000	882,000	
12,932	60,587	26,494	157,176			
6,370	26,610					
						271,014
26,630	92,487	3,750	17,813			
69,200	326,900	600	1,500			
5,500	27,250	6,000	18,200			
2,450	10,825	7,600	19,778			
150	600					25,000
2,500	10,000			646,050	1,849,638	292,626
				124,256	435,000	104,000
5,000	12,600	42,000	231,840			60,000
11,000	53,750					
		6,300	14,250			
1,400	5,350			36,000	99,000	61,000
13,600	101,130	57,000	304,500			
		12,000	40,000			
				1,366,715	3,399,999	
2,080	7,113	8,768	25,504			
2,000	5,856					
2,125	6,600					24
				435,810	1,380,978	
				26,000	75,000	
				1,234,526	3,514,926	60,000
6,350	26,050	1,200	2,244			
				940,000	3,522,500	
				90,000	225,000	187,140
4,890	13,750	22,464	78,624			
1,000	2,500					95,000
444,372	\$2,099,803	409,817	\$1,730,464	6,488,026	\$19,164,969	2,747,684

TANNING

COUNTY.	Number of tanneries and extract works.	Valuation.	Number of sides of upper leather tanned.	Valuation.
Adams,	8	..	..	..
Allegheny,	18	..	..	..
Armstrong,	3	..	..	..
Bedford,	12	..	4,550	\$10,125
Berks,	14	..	200	400
Bradford,	7	\$503,500	..	..
Cambria,	6	165,450	2,100	3,425
Cameron,	3	234,000	..	..
Centre,	4	441,168	700	1,190
Chester,	2	..	..	..
Clearfield,	8	2,087,500	195,000	751,000
Clinton,	4	675,000	500	1,250
Columbia,	8	..	1,098	1,750
Crawford,	5	..	..	..
Cumberland,	6	..	..	..
Dauphin,	8	..	..	..
Elk,	7	1,837,751	..	..
Erie,	9	36,800	..	..
Fayette,	2	..	..	..
Forest,	4	..	80,000	240,000
Franklin,	9	..	..	..
Fulton,	3	..	..	..
Huntingdon,	8	..	..	..
Indiana,	5	..	548	1,114
Jefferson,	3	805,230	..	..
Juniata,	4	..	..	..
Lancaster,	8	..	..	..
Lebanon,	3	..	..	..
Lehigh,	9	..	72,100	225,400
Luzerne,	2	62,500	1,000	1,500
Lycoming,	9	898,597	..	..
McKean,	6	249,600	..	..
Mifflin,	3	..	..	..
Monroe,	2	240,000	..	..
Montgomery,	4	..	..	..
Northampton,	4	..	..	..
Northumberland,	4	215,000	40	70
Perry,	7	..	..	..
Philadelphia,	46	..	..	..
Potter,	6	..	93,600	234,000
Schuylkill,	3	..	..	..
Snyder,	3	..	..	..
Somerset,	8	45	224	560
Sullivan,	3	..	..	..
Susquehanna,	4	..	116,700	230,575
Tioga,	15	270,000	44,000	90,080
Union,	4	..	..	..
Warren,	11	..	..	..
Wayne,	2	..	..	..
Wyoming,	4	808,200	..	..
York,	10	..	..	..
Miscellaneous,	9	262,500	500	700
Total,	358	\$9,792,844	612,860	\$1,793,139

INDUSTRY.

Number of sides tanned for all other purposes.	Valuation.	Number of calf and kip skins tanned.	Valuation.	Number of goat skins tanned.	Valuation.	Number of sheep skins tanned.
10,720	\$26,390	240	\$455	.	.	.
449,000	2,192,000	.	.	.	.	79,200
.	.	125	250	.	.	100
13,765	58,580	705	1,453	.	.	.
200	400	81,075	146,575	.	.	373,400
.
500	1,025	1,800	3,100	.	.	675
.
.	.	300	600	.	.	.
.
.	.	500	750	.	.	.
2,300	5,560	598	1,128	.	.	157
15,344	30,688	.	.	.	.	.
6,800	17,000	.	.	.	.	.
7,450	16,850	965	1,507	32	\$62	50
.
80,440	160,880	.	.	.	.	.
7,800	16,275	150	450	.	.	.
.
9,800	23,600	1,515	2,830	.	.	.
2,500	6,000	225	275	.	.	.
1,300	3,000	150	300	.	.	.
3,300	11,160	454	1,390	.	.	24
.
3,000	9,000	900	2,025	.	.	.
.
750	1,687	4,000	8,175	.	.	.
.	.	300	400	.	.	100
.	.	1,500	2,250	.	.	.
.
.	.	500	500	.	.	.
17,000	55,000	.	.	.	.	.
800	2,400	31,200	70,650	.	.	.
1,000	3,000	130,200	248,400	.	.	.
6,040	1,525	.	.	175	394	.
.	.	475	675	.	.	.
23,196	84,300	278,796	448,311	16,443.434	12,812,689	659,112
.
9,268	27,804	.	.	.	.	.
1,100	2,475	400	975	.	.	.
225	325	1,275	2,673	.	.	287
.
.
8,736	18,346	.	.	.	.	.
.
142,000	288,000	1,375	3,075	.	.	.
.
.
21,700	53,150	1,175	1,735	.	.	.
22,000	86,800	650	1,050	.	.	.
.
868,034	\$3,203,220	541,548	\$951,957	16,443.641	\$12,813,145	1,113,105

TANNING

COUNTY.	Number of tanneries and extract works.	Valuation.	Number of splits tan- ned.	Valuation
Adams,	8			
Allegheny,	18	\$24,600		
Armstrong,	8	43		
Bedford,	12			
Berks,	14	190,200		
Bradford,	7			
Cambria,	6	270	2,000	\$200
Cameron,	3			
Centre,	4			
Chester,	2			
Clearfield,	8		180,000	125,000
Clinton,	4			
Columbia,	8	111		
Crawford,	5			
Cumberland,	6			
Dauphin,	8	100		
Elk,	7			
Erie,	9			
Fayette,	2			
Forest,	4			
Franklin,	9		25,000	12,500
Fulton,	3			
Huntingdon,	8			
Indiana,	5	16		
Jefferson,	3			
Juniata,	4			
Lancaster,	8			
Lebanon,	5			
Lehigh,	5			
Luzerne,	2	25		
Lycoming,	9			
McKean,	6			
Mifflin,	3			
Monroe,	2			
Montgomery,	4			
Northampton,	4			
Northumberland,	4			
Perry,	7			
Philadelphia,	46	344,663		
Potter,	6			
Schuylkill,	3			
Snyder,	3			
Somerset,	8	152		
Sullivan,	3			
Susquehanna,	4			
Tioga,	15			
Union,	4			
Warren,	11			
Wayne,	2			
Wyoming,	4			
York,	10			
Miscellaneous,	9			
Total,	358	\$560,180	207,000	\$137,700

INDUSTRY.

Valuation of all other products.	Total valuation.	Number of barrels of hemlock bark extract manufactured during year ending January 1, 1892.	Valuation.	Number of barrels of oak bark extract manufactured during year ending January 1, 1892.	Valuation.	Total valuation of all extracts manufactured.
\$1,560	\$44,875					
	3,681,600					
	13,943					
21,697	1,449,280					
	445,225					
	1,932,460					
	236,200					
	846,500					
	454,358					
	29,310					
	3,513,500					
10,000	781,000					
839	16,663					
595,600	743,288					
	56,400					
	126,689					
400	3,370,619	5,900	\$73,750			\$73,750
	322,430					
	16,725					
10,000	1,132,000	7,500	112,500			112,500
	148,999					
	7,225					
	335,463			10,300	\$133,900	133,900
	40,390					
	805,230					
	132,325					
	337,400					
	45,450					
	265,765					
	65,025					
	2,760,485	2,000	24,000			24,000
459,000	1,143,600	20,500	256,250			256,250
	269,940					
	236,000					
	126,800					
	265,650					
485	321,824					
	424,272					
1,975	13,731,938					
	3,633,999					
	60,421					
	86,682					
3	10,371					
	1,180,978					
	305,575					
	3,832,352					
	31,369					
	2,810,500					
	225,000					
	808,209					
1,000	148,259			6,300	78,750	78,750
	419,426					
\$1,102,559	\$55,288,978	35,900	\$466,500	16,600	\$212,650	\$679,150



PETROLEUM, ITS PRODUCTION AND PRODUCTS.*

ANALYSIS.

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* Prepared, at request of the Bureau, by H. C. Folger, Jr.

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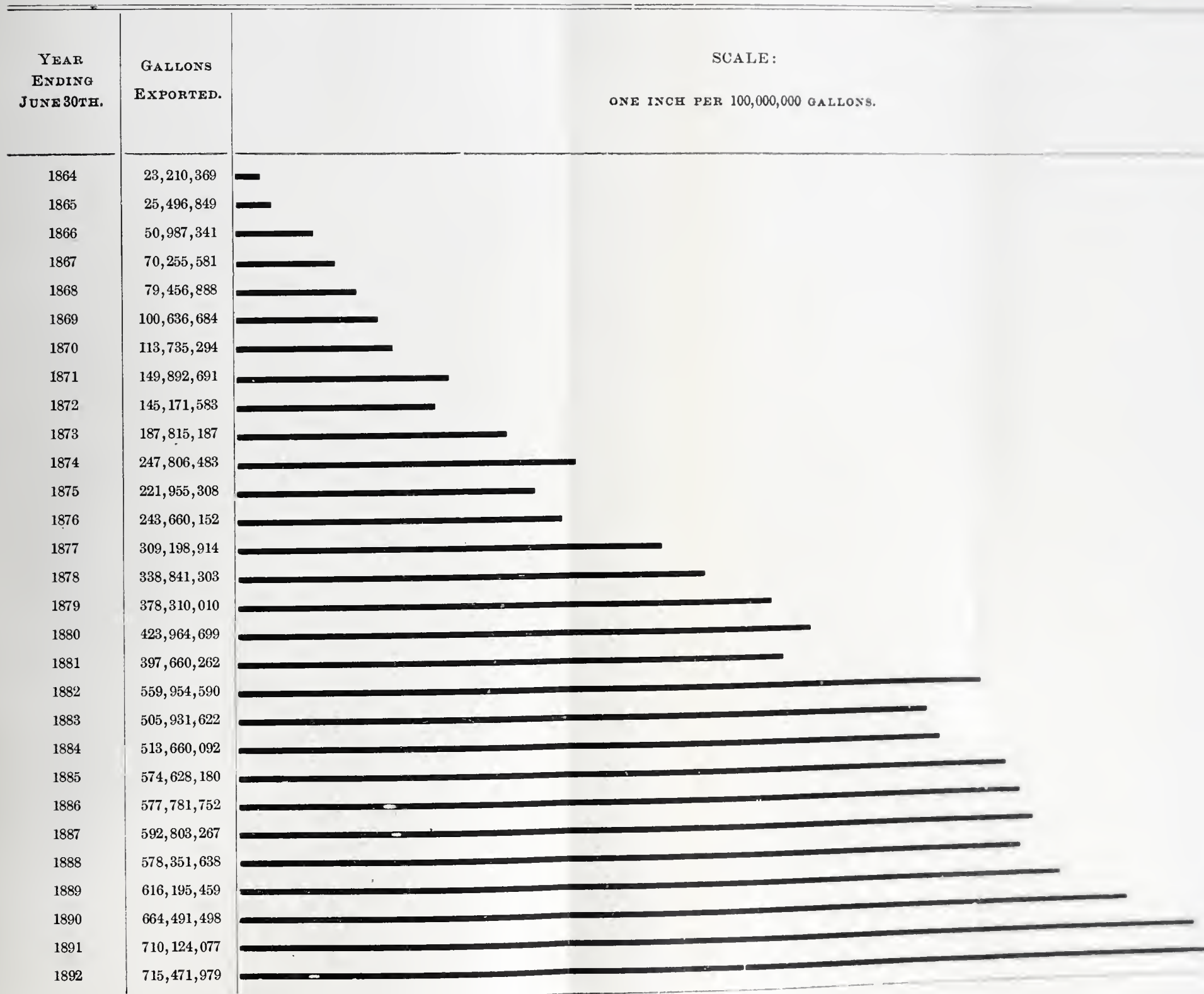
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[Table A.]

EXPORTS OF PETROLEUM.



INTRODUCTION.

Petroleum is a product of peculiar interest to the people of Pennsylvania. Although to-day a part of the crude material is mined in some of the adjoining states and a considerable portion of the refining is done outside the boundaries of our commonwealth, we can justly claim that the home of the industry has been, and still is, here. Few of us, familiar as most are with the sight of oil derricks and trains of tank cars, comprehend the phenomenal growth and present magnitude of petroleum production and manufacture. If any one questions this statement, he surely will not after an attentive reading of this report.

Scarcely thirty years have passed since the first still was charged with petroleum, and the first barrel of refined oil offered for sale; yet the exports already rank fourth in the list for value, being surpassed only by cotton, breadstuffs and provisions; while, in our own country nearly every home is blessed with petroleum's beneficent light. For the year ending June 30, 1864, only twenty-nine years ago, the total exports were 23,000,000 gallons. By 1869, they had grown to 100,000,000 gallons; by 1874, to 200,000,000 gallons; by 1877, to 300,000,000 gallons; by 1880, to 400,000,000 gallons; by 1882, to 500,000,000 gallons; by 1889, to 600,000,000 gallons; by 1891, to 700,000,000 gallons. To-day a larger percentage of the oil product of the country is sent abroad than of any other product except cotton.

The growth in exports of illuminating oils is still more marked. Those for the year ending June 30, 1866, were three times those of 1864; those of 1868, twice those of 1866 and six times those of 1864; those of 1871, twice those of 1868 and twelve times those of 1864; those of 1877, twice those of 1871 and twenty-four times those of 1864; those of 1891, twice those of 1877 and forty-eight times those of 1864; those of 1892, over fifty times those of 1864. In other words, beginning with 1866, the exports of illuminating oils were doubled in 1868, again in 1871, again in 1877 and again in 1891; so that those of 1891 were twice those of 1887, four times those of 1871, eight times those of 1868, sixteen times those of 1866 and forty-eight times those of 1864. The average exports per week in 1892 were as much as for the entire year of 1864. The world has reason to be thankful for Pennsylvania petroleum.

We are especially impressed with this thought when, in the light of the great growth in business, we study the reduction in prices. Export oil averaged in 1861, $61\frac{1}{2}$ cents per gallon; in 1871, $23\frac{3}{8}$ cents per gallon; in 1881, 8 cents per gallon; in 1891, $6\frac{7}{8}$ cents per gallon; in 1892, 6 cents per gallon, or less than one-tenth that in 1861. But this decrease, great as it is, does not represent the real reduction in the price of oil; as the cost of the barrel is included in these prices. A gallon of bulk oil cost

in 1861, not less than 58 cents; in 1892, not more than $3\frac{1}{2}$ cents, or hardly one-seventeenth. In January, 1861, the price was 75 cents; in January, 1892, 3 cents, or one-twenty-fifth that of thirty-two years ago. The money that, in 1861, was required to buy a thousand barrels of oil, will to-day purchase twenty-five thousand barrels.

Enormous capital and energy have been required to establish an industry of such magnitude. Pipe lines aggregating 25,000 miles in length—a girdle for the globe—and 9,000 tank cars—placed end to end, an unbroken train extending two-thirds the distance between Harrisburg and Philadelphia, or three-fourths that between Philadelphia and New York—helped in moving the products to the home markets; while 59 bulk steamers, not to mention bulk sailing vessels and the fleet of steamers and ships carrying oil in barrels and cases, transported them to the most distant quarters of the earth. Petroleum undoubtedly has a wider sale than any other American product. Where commerce has made its way it has found a welcome. “It is carried wherever a wheel can roll or a camel’s foot be planted. The caravans on the Desert of Sahara go laden with Astral oil, and elephants in India carry cases of Standard White. Ships are constantly loading at our wharves for Japan, India, and the most distant isles of the sea.”

The able special agent on petroleum for the Eleventh United States Census estimates the value of Pennsylvania oil wells and land at over \$87,000,000, and shows that the investment in plant employed in the production of crude petroleum will bring this sum up to \$150,000,000. This does not include the value of pipe lines, nor of tank cars, nor of the great fields of tankage for the storage of crude, nor of the costly refineries, nor of the terminals and docks at the sea-board for export shipments, nor of the fleet of bulk vessels carrying the product to foreign shores. The census report, when published, will give the value of refineries as over \$75,000,000. We think it no exaggeration to estimate the total capital required for the production, manufacture and transportation of petroleum and its products at \$300,000,000.*

*In preparing this report our indebtedness is acknowledged to the admirable *Geology of the Oil Region* by Mr. J. F. Carll, published as part of the Second Geological Survey of our state; to the comprehensive report on petroleum by Prof. S. F. Peckham for the Tenth United States Census; to much valuable information furnished us in advance of his report on petroleum for the Eleventh United States Census by Mr. J. D. Weeks; and to the uniform courtesy of the officers of the various branches of the Standard Oil Company, without whose aid this article would have been far from complete. We have been helped also by nearly all of the books mentioned in our list on the literature of petroleum.

GENERAL STATISTICS OF THE PETROLEUM INDUSTRY.

[TABLE B.]

YEAR.	CRUDE OIL.						EXPORTS—FISCAL YEAR ENDING JUNE 30.	
	Production (barrels of 42 gallons).	Shipments (barrels of 42 gallons).	Stocks, close of year (barrels of 42 gallons).	Number of wells completed.	Price at wells per barrel.	Refined oil—Average price paid per gallon in barrels for export at New York.	Total quantity (gallons).	Total value.
1861.	2,113,600	1,650,133	Unknown.	Unknown.	\$0 52	\$0 61½	Unknown.	Unknown.
1862.	3,056,606	3,101,571	Unknown.	Unknown.	1 00	36½	Unknown.	Unknown.
1863.	2,611,359	3,242,951	Unknown.	Unknown.	3 11	44½	Unknown.	Unknown.
1864.	2,116,182	1,842,061	Unknown.	Unknown.	7 85	65	23,210,369	\$10,782,089
1865.	3,497,712	2,190,132	Unknown.	Unknown.	6 59	58½	25,496,849	16,563,413
1866.	3,597,527	3,010,921	Unknown.	Unknown.	3 74	42½	50,987,341	24,830,887
1867.	3,346,306	2,393,210	534,000	Unknown.	2 41	28½	70,255,581	24,407,642
1868.	3,715,741	3,482,510	264,805	Unknown.	3 62½	29½	79,456,888	21,910,676
1869.	4,186,475	4,255,343	340,154	Unknown.	5 63½	32½	100,636,684	31,127,433
1870.	5,308,046	5,593,168	537,751	Unknown.	3 84	26½	113,735,294	32,668,960
1871.	5,205,234	5,664,791	532,000	Unknown.	4 47	24½	149,892,691	36,894,810
1872.	6,293,194	5,899,947	1,084,423	1,183	3 95	23½	145,171,583	34,068,390
1873.	9,893,786	9,499,775	1,625,137	1,263	1 73	17½	187,815,187	42,050,756
1874.	10,926,945	8,821,500	3,705,639	1,317	1 18	13	247,806,483	41,245,815
1875.	8,787,514	8,942,938	3,550,207	2,398	1 25	13	221,955,308	30,078,568
1876.	8,968,906	10,164,452	2,551,199	2,920	2 51	19½	243,660,152	32,915,796
1877.	13,135,475	12,832,573	3,127,837	3,939	2 39	15½	309,198,914	61,789,438
1878.	15,163,462	13,076,000	4,615,299	3,064	1 16	10½	338,841,303	46,574,974
1879.	19,685,176	15,886,470	8,470,490	3,048	88	8½	378,310,010	40,305,249

GENERAL STATISTICS OF THE PETROLEUM INDUSTRY—Continued.

[TABLE B.]

YEAR.	CRUDE OIL.					Refined oil—Average price paid per gallon in barrels for export at New York.	EXPORTS—FISCAL YEAR ENDING JUNE 30.	
	Production (barrels of 42 gallons).	Shipments (barrels of 42 gallons).	Stocks, close of year (barrels of 42 gallons).	Number of wells completed.	Price at wells per barrel.		Total quantity (gallons).	Total value.
1880,	26,027,631	15,677,492	18,928,430	4,217	\$0 94½	\$0 09	423,964,639	\$36,218,625
1881,	27,376,509	20,284,235	26,019,704	3,880	85½	8	397,660,262	40,315,609
1882,	30,053,500	21,900,314	34,596,612	3,304	78½	7½	559,954,590	51,232,706
1883,	23,128,389	21,973,369	35,745,632	2,847	1 06¼	8	505,931,622	44,913,079
1884,	23,772,209	23,657,597	37,366,126	2,265	83½	8½	513,660,092	47,103,248
1885,	20,776,041	23,713,326	34,428,841	2,761	88½	8	574,628,180	50,257,947
1886,	25,798,000	26,653,852	34,156,605	3,478	71½	7½	577,781,752	50,199,844
1887,	21,478,863	27,270,028	28,006,211	1,690	66½	6½	532,803,267	46,824,933
1888,	16,488,668	25,138,031	18,995,814	1,515	87	7½	578,351,638	47,042,409
1889,	21,487,435	20,638,898	11,562,593	5,435	94	7½	616,195,459	49,913,677
1890,	30,065,867	30,116,075	9,993,600	6,437	86½	7½	664,491,498	51,403,089
1891,	35,742,152	30,193,940	15,354,233	3,390	66½	6½	710,124,077	52,026,734
1892,	33,332,306	31,048,944	17,395,389	1,954	55½	6	715,471,979	44,805,992

PART I. PETROLEUM PRODUCTION.

HISTORICAL SKETCH.

Early History.—Drake's Well.—Development since 1859.

EARLY HISTORY.—It is impossible to state when petroleum was first discovered. In some form it seems to have been applied to the uses of mankind from the earliest periods known to history. The "slime" of Old Testament Scripture, mentioned as the mortar used in constructing the Tower of Babel, 2,200 years before Christ (Gen. xi, 3), was probably partially evaporated petroleum; and the "pitch" with which Noah coated the ark, 250 years earlier (Gen. vi, 14), was doubtless a similar product.

The ruins of Nineveh and Babylon indicate that the asphaltic cement used for their walls and buildings was composed, in part at least, of semi-fluid bitumen. Herodotus wrote: "Eight days' journey from Babylon stands another city called Is, on a small river of the same name, which discharges its stream into the Euphrates. Now this river brings down with its water many lumps of bitumen, from whence the bitumen used in the walls of Babylon was brought." The same writer elsewhere (I, 119) speaks of the oil springs in the island of Zante: "I have myself seen pitch drawn out of the lake and from water in Zacynthus." This was about 500 B. C.

In the first century before Christ, Strabo refers to the bitumen from the region of the Dead Sea sold the Egyptians for embalming; and this is confirmed by Diodorus Siculus, the Greek historian, who describes the collection of this asphalt and the commerce in it with Egypt. Aristotle, and later, Josephus, Pliny, and Plutarch make mention of the deposits found in Albania on the Adriatic sea. The holy fires of Baku on the Caspian, the home of the fire god, have been known and worshipped for at least twenty-five centuries. Six hundred years before Christ this spot was the goal of pilgrimages even from India. (See Vigne's *Travels in Kashmir and Little Thibet*: also Marvin's *Region of Eternal Fire*.)

Perhaps the first mention of the use of petroleum for illuminating purposes is the "Sicilian oil", described by Pliny, the historian, and Dioscorides Pedanius, the Greek botanist, as secured near Agrigentum, now called Girgenti, on the island of Sicily, to be remembered as the site of the temples of Concord and of Olympian Jupiter. This oil was burned in lamps as early as the beginning of the Christian era.

It would not be difficult to continue this record and show that from

the periods already mentioned down to the establishment of petroleum as a staple article of commerce, there is an unbroken line of evidence that travellers found it in almost every quarter of the globe. But it is of especial interest, we think, to note, as we have done, the great antiquity of its use.

In America the Indians collected what was known as "Seneca oil" from petroleum springs; and the indications are that, long before them, the Mound Builders who worked the copper mines of Lake Superior, the lead mines of Kentucky, and the mica mines of North Carolina, not only gathered the oil that flowed from natural springs and appeared on streams, but even dug numerous wells in our own state, Ohio and Canada, and dipped up the petroleum that flowed into them. Trees, now growing in the earth thrown out in digging the wells, or in the wells themselves, show that this work was done from 500 to 1,000 years ago. Prof. S. F. Peckham, in his exhaustive report for the Tenth United States Census (to which we are indebted for much valuable information), states that the earliest mention that has come to his notice of petroleum in America is that of 1629; when Joseph de la Roche D'Allion, a Franciscan Missionary, crossed the Niagara river from Canada into what is now New York. He wrote back of the oil spring known to the Indians. The name which they had given the place was significant, meaning "there is plenty there." This letter, he says, was published in Sagard's *Histoire du Canada*, 1632, and afterwards in *Le Clerc*. We learn from *Stowell's Petroleum Reporter* that, in 1721, Charlevoix, the French historian and missionary to Canada, who, among other exploits, descended the Mississippi river to its mouth, quotes Captain de Joncaire as stating that there is a "fountain at the head of a branch of the Ohio" (the Allegheny river, no doubt) "the water of which is like oil, has a taste of iron, and serves to appease all manner of pain." We must take space for the following from the first volume of the *Massachusetts Magazine*, issued in 1789:—

"In the northern part of Pennsylvania is a creek called Oil creek, which empties into the Allegheny river. It issues from a spring on which floats an oil similar to that called Barbadoes tar, and from which one may gather several gallons a day. The troops, sent to guard the western posts, halted at this spring, collected some of the oil, and bathed their joints with it. This gave them great relief from the rheumatism with which they were afflicted. The water, of which the troops drank freely, operated as a gentle purge."

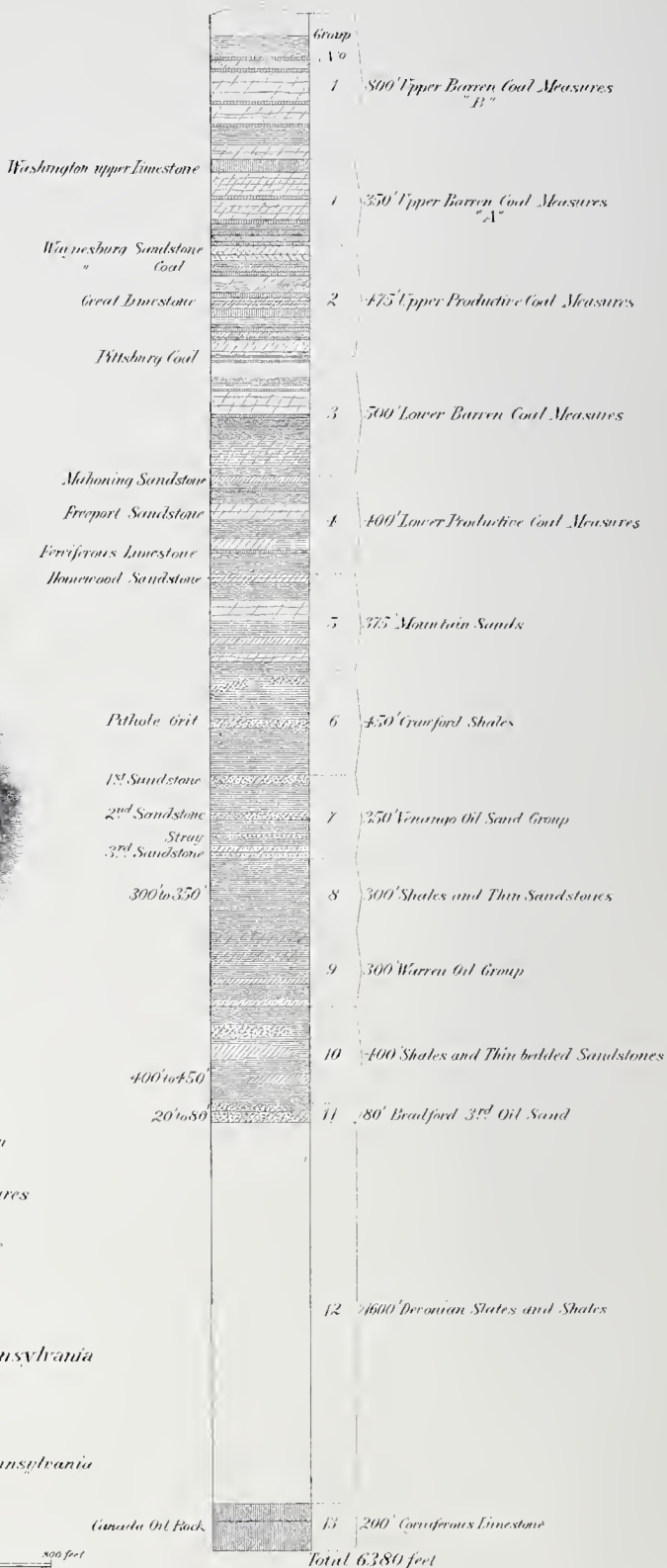
In Henry's *Early and Later History of Petroleum*, a letter from the commander of Fort DuQuesne, written to General Montcalm in 1750, is given, showing not only the medicinal qualities that had been found efficacious in the springs of Oil creek and the neighboring country, but the employment of the oil for religious rites much like those in vogue on the Apsheron peninsular in the Caspian sea, of which mention has already been made:—



Col. G. L. Drake.

Generalized Vertical Section
from the top of the
Upper Barren Coal Measures
down to the
Corniferous Limestone
to show the various
Oil Horizons
of
Canada, New York and Pennsylvania
Compiled by
J. F. Carl
for the
Second Geological Survey of Pennsylvania
drawn by
Laura Linton

Scale
400 300 200 100 0 400 800 feet



"I would desire to assure you that this is a most delightful land. Some of the most astonishing natural wonders have been discovered by our people. While descending the Allegheny, fifteen leagues below the mouth of the Conewango and three above the Venango, we were invited by the chief of the Senecas to attend a religious ceremony of his tribe. We landed, and drew up our canoes on a point where a small stream entered the river. The tribe appeared unusually solemn. We marched up the stream about half a league, where the company, a band it appeared, had arrived some days before us. Gigantic hills begirt us on every side. The scene was really sublime. The great chief then recited the conquests and heroism of their ancestors. The surface of the stream was covered with a thick scum, which, upon applying a torch at a given signal, burst into a complete conflagration. At the sight of the flames, the Indians gave forth the triumphant shout that made the hills and valleys re-echo again. Here, then, is revived the ancient fire-worship of the East; here, then, are the Children of the Sun."

Soon after the opening of the present century, the boring of wells for brine from which to make salt was successfully undertaken. At Tarentum on the Allegheny river some of these wells were operated before 1810, but the first borings were made on the Kanawha river in West Virginia, if we accept the claims of Dr. J. P. Hale in the article he prepared for Professor M. F. Maury's book on the resources and industries of that state.

Salt and oil have so often been found in the same geological formation that scientists have tried to account for them as of one origin. These West Virginia salt wells become of interest to us when we note that oil appeared in all of them, and was a source of considerable annoyance. Dr. Hale describes the efforts of two Ruffner Brothers, beginning in 1806, to put down deep wells for salt; resulting in a bore of nearly 60 feet, soon followed by other and deeper borings. The item of interest to us is the following:—

"Nearly all the Kanawha salt wells have contained more or less petroleum, and some of the deeper wells a considerable flow. Many persons now think, trusting to their recollections, that some of the wells afforded as much as 25 to 50 barrels per day. This was allowed to flow over from the top of the salt cisterns to the river, where, from its specific gravity, it spread over a large surface, and by its beautiful iridescent hues and not very savory odor could be traced for many miles down the stream. It was from this that the river received the nickname of 'Old Greasy,' by which it was for a long time known by Kanawha boatmen and others."

A valuable reference to petroleum is found in Dr. S. P. Hildreth's article published in 1833, in the *American Journal of Science and Arts*:—

"Since the first settlement of the regions west of the Appalachian range the hunters and pioneers have been acquainted with this oil. Rising in a hidden and mysterious manner from the bowels of the earth, it soon arrested their attention, and acquired great value in the eyes of these simple sons of the forest. Like some miraculous gift from heaven, it was thought to be a sovereign remedy for nearly all the diseases common to those primeval days, and from its success in rheumatism, burns,

coughs, sprains, etc., was justly entitled to all its celebrity. It acquired its name of Seneca oil, that by which it is generally known, from having first been found in the vicinity of Seneca lake, New York. In the neighborhoods where it is abundant it is burned in lamps in place of spermaceti oil, affording a brilliant light, but filling the room with its own peculiar odor. By filtering it through charcoal much of this empyreumatic smell is destroyed and the oil greatly improved in quality and appearance. It is also well adapted to prevent friction in machinery, for, being free of gluten, so common to animal and vegetable oils, it preserves the parts to which it is applied for a long time in free motion; where a heavy vertical shaft runs in a socket it is preferable to all or any other articles. This oil rises in greater or less abundance in most of the salt wells of the Kanawha, and, collecting where it rises, is removed from time to time with a ladle."

He refers to one well in particular, dug in 1814 to a depth of 475 feet. This was a flowing well, discharging "periodically at intervals of from two to four days, and from three to six hours duration at each period," 30 to 60 gallons at each irruption. When the oil flowed, great quantities of natural gas were also discharged.

This review would hardly be complete without some reference to the well near Burkesville, Ky., bored in 1829. Mr. Peckham quotes from Niles' *Register* :—

"Some months since, in the act of boring for salt water on the land of Mr. Lemuel Stockton, situated in the county of Cumberland, Kentucky, a run of pure oil was struck, from which it is almost incredible what quantities of the substance issued. The discharges were by floods, at intervals of from two to five minutes, at each flow vomiting forth many barrels of pure oil. I witnessed myself, on a shaft that stood upright by the aperture in the rock from which it issued, marks of oil 25 or 30 feet perpendicularly above the rock. These floods continued for three or four weeks, when they subsided to a constant stream, affording many thousand gallons per day. This well is between a quarter and a half mile from the bank of the Cumberland river, on a small rill (creek) down which it runs to the Cumberland river. It was traced as far down the Cumberland as Gallatin, in Sumner county, Tennessee, nearly 100 miles. For many miles it covered the whole surface of the river, and its marks are now found on the rocks on each bank.

"About two miles below the point on which it touched the river, it was set on fire by a boy, and the effect was grand beyond description. An old gentleman who witnessed it says he has seen several cities on fire, but that he never beheld anything like the flames which rose from the bosom of the Cumberland to touch the very clouds."

We will close this outline of the earlier production of American petroleum by an extract from an article written by Professor Benjamin Silliman, the elder, for the *American Journal of Science and Arts* in 1833, descriptive of the oil springs of the Seneca Indians, near Cuba, N. Y.:—

"This is situated in the western part of the county of Allegheny, in the state of New York. This county is the third from Lake Erie on the south line of the state, the counties of Cattaraugus and Chautauqua lying west and forming the southwestern termination of the State of New York. The spring is very near the line which divides Allegheny

and Cattaraugus.* * * The country is rather mountainous, but the road running between the ridges is very good and leads through a cultivated region rich in soil and picturesque in scenery. Its geographical formation is the same with that which is known to prevail in the western region; a silicious sandstone with shale, and in some places limestone, is the immediate basis of the country. The sandstone and shale (the limestone I did not see) lie in nearly horizontal strata. The sandstone is usually of a light gray color, and both it and the shale abound with *entocites*, *encrinites*, *coralines*, *terebratula*, and other *reliquiae* characteristic of the secondary transition formation. The oil spring or fountain rises in the midst of a marshy ground. It is a muddy, dirty pool of about eighteen feet in diameter and is nearly circular in form. There is no outlet above ground, no stream flowing from it, and it is, of course, a stagnant water, with no other circulation than that which springs from the changes in temperature and from the gas and petroleum that are constantly rising through the pool.

"We are told that the odor of petroleum is perceived at a distance in approaching the spring. This may not improbably be true in particular states of the wind, but we did not distinguish any peculiar smell until we arrived on the edge of the fountain. Here its peculiar character became very obvious. The water is covered with a thin layer of petroleum or mineral oil, giving it a foul appearance as if coated with dirty molasses, having a yellowish brown color.

"They collect the petroleum by skimming it like cream from a milk pan. For this purpose they use a broad flat board made thin at one edge like a knife, it is moved flat upon and just under the surface of the water and is soon covered by a coating of petroleum, which is so thick and adhesive that it does not fall off, but is removed by scraping the instrument upon the lip of a cup. It has then a very foul appearance, like very dirty tar or molasses, but it is purified by heating and straining it while hot through flannel or other woolen stuff. It is used by the people of the vicinity for sprains and rheumatism, and for sores on their horses.

"It is not monopolized by any one, but is carried away freely by all who care to collect it, and for this purpose the spring is frequently visited. I could not ascertain how much is annually obtained, the quantity must be considerable. It is said to rise more abundantly in hot weather than in cold.

"I cannot learn that any considerable part of the large quantities of petroleum used in the Eastern States under the name of 'Seneca Oil' comes from the spring now described. I am assured that its source is about one hundred miles from Pittsburg, on Oil creek, which empties into the Allegheny river in the township and county of Venango. It exists there in great abundance and rises in purity to the surface of the water. By dams, inclosing certain parts of the river or creek, it is prevented from flowing away and it is absorbed by the blankets, from which it is wrung * * * And as there are numerous springs of this mineral oil in various regions of the west and south connected especially with the saline and bituminous coal formations, it would promote the cause of science if notices of any of them were forwarded for publication.

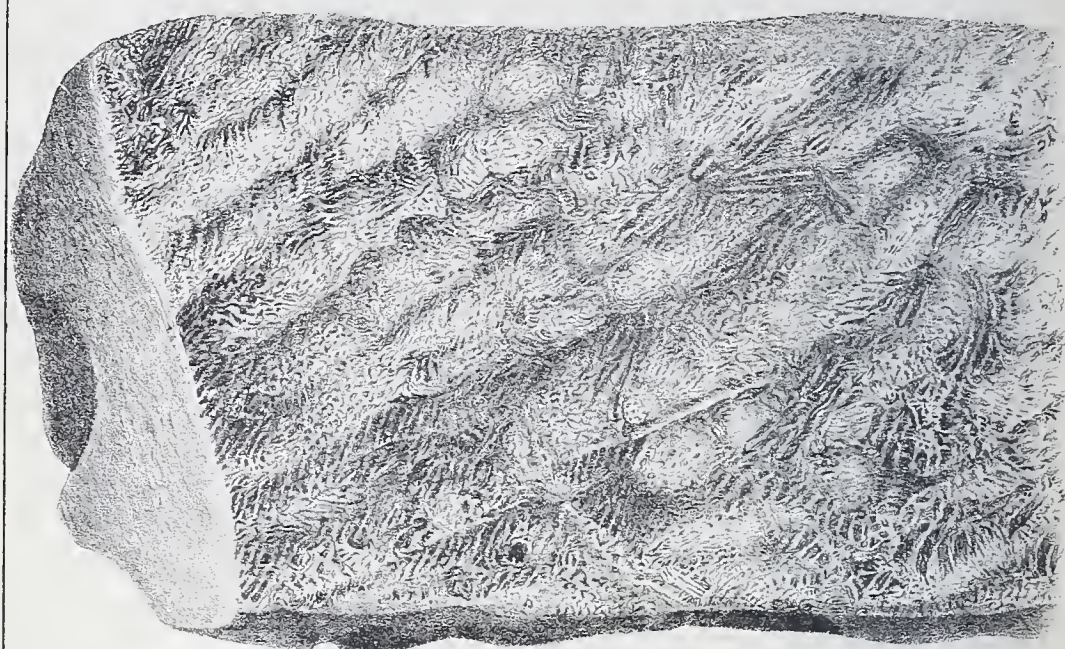
"The petroleum sold under the name of 'Seneca Oil' is of a dark color, between that of tar and molasses, and its degree of consistency is not dissimilar, according to temperature. Its odor is strong and too well

known to need description. I have frequently distilled it in a glass retort, and the naptha which collects in the receiver is of a light straw color and much lighter, more odorous and inflammable than petroleum. In the first distillation a little water usually rests in the receiver at the bottom of the naptha. From this it is easily decanted, and a second distillation prepares it perfectly for preserving potassium and sodium, the object which led me to distil it, and these metals I have kept under it, as others have done, for years. Eventually they acquire some oxygen from or through the naptha, and the exterior portion of the metal returns slowly to the condition of alkali, more rapidly if the stopper is not tight. The petroleum remaining from distillation is thick like pitch. If the distillation has been pushed far the residum will flow only languidly into the retort, and in cold weather it becomes a soft solid resembling mineral pitch."

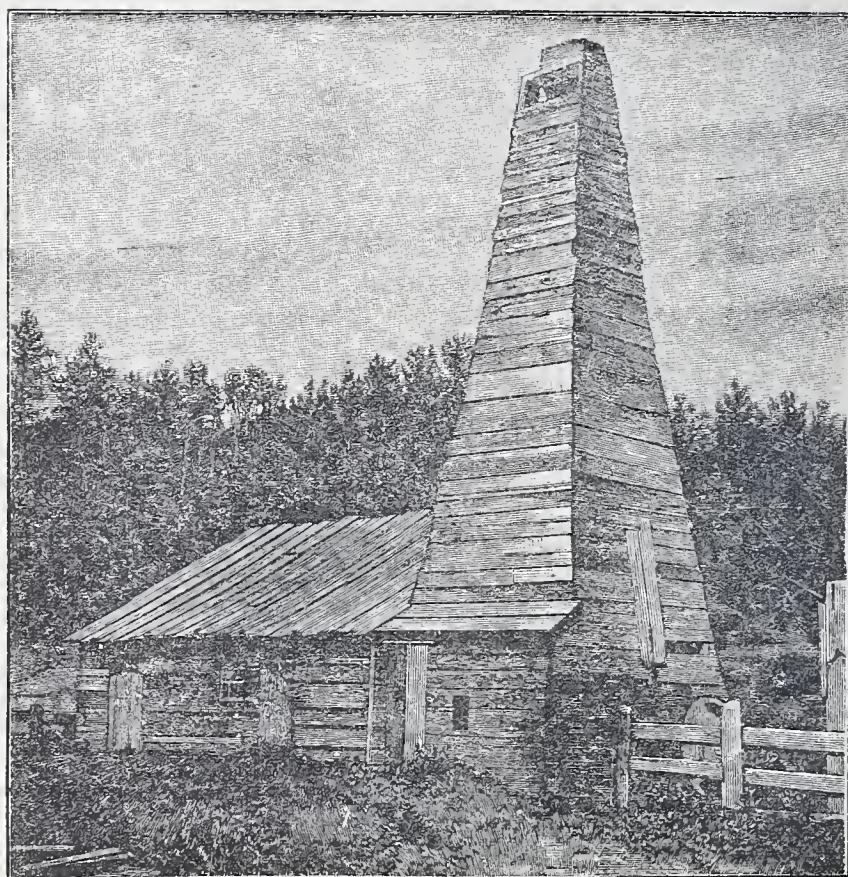
DRAKE'S WELL.—The historic moment for petroleum was that at which Drake "struck oil" on Watson's flats, near Titusville, August 28, 1858. It was an event so momentous to the future of the grand industry it started that this report would be far from complete if it did not devote considerable space to the story. As might be expected, every writer on petroleum makes some reference to this well, but we are particularly indebted for what follows to the graphic description of Henry in his *Early and Later History of Petroleum*, to Crew in his *Practical Treatise on Petroleum*, and to Peckham's most comprehensive report for the Tenth United States Census. The accuracy of the statements have been verified, and many new facts added to the exhaustive records, by personal interviews on the part of the writer with the practical men who have been familiar with the petroleum industry from its inception, and with old residents of Titusville and the vicinity who could recall the events of thirty years ago with great exactness.

The first oil company organized in the United States was the Pennsylvania Rock Oil Company, with a nominal capital of \$500,000, which filed its certificate of incorporation, according to law, in the clerk's office at Albany, New York, December 30, 1854. The projectors were George H. Bissell and Jonathan D. Eveleth, members of a law firm in New York city. It chanced that Mr. Bissell's attention had been directed to petroleum by noticing a sample of it when on a visit to Hanover, N. H., his native place. This sample had been brought to Professor Crosby, of Dartmouth College, by Dr. T. B. Brewer, the son of one of the members of the firm of Brewer & Watson, lumber merchants of Titusville. Mr. Bissell's interest found substantial expression in the purchase of one hundred and five acres of the "Watson's flats" near Titusville, including an island at the junction of Oil and Pine creeks. It was on this island that oil had been collected for eight or nine years by means of a series of pits, arranged like separators, the water flowing away below leaving the oil floating on the surface to be dipped up with blankets. Some of the organizers of the company resided at New Haven, Conn., and, at their suggestion, a quantity of the oil was sent Prof. Benjamin

Pl. II.



Petroleum Rock.



The First Oil Well.

Drilled by Col. Drake in 1859, near Titusville, Pa.

Silliman, Jr., who made an exhaustive analysis and an elaborate report. As the result of this examination, which was most favorable, a "Pennsylvania Rock Oil Company" was formed in Connecticut, with New Haven as its headquarters, and the property held by the New York corporation transferred to it.

This brings us to 1857. During the three or four years intervening the territory had been worked for oil with indifferent success, by means of trenches and shallow wells. Mr. Bissell still retained his interest in the Connecticut company. He happened, in 1856, to see an advertisement of "Kier's Petroleum." This was a patent medicine owned by Samuel M. Kier, a druggist of Pittsburg. His advertisement showed the derrick of the brine well from which the oil was secured with the brine. It suggested to Mr. Bissell that perhaps the crude, which was being obtained in such limited quantities by means of the surface pits and trenches at Titusville, might be found in paying quantities if artesian wells were sunk. The Seneca Oil Company succeeded the Pennsylvania Rock Oil Company of Connecticut in 1857, with the plan of seeking for the oil by drilling. E. L. Drake, who soon became known as "Colonel" Drake, was sent to Titusville the following year to carry out this project. It took a month to secure necessary tools and men sufficiently skilled to sink the well. Besides, the hole he tried to dig down to the rock at which to begin drilling filled with water and quicksand and forced him to invent some new way of reaching that point. It occurred to him to drive a pipe through the sand and clay, a plan afterwards generally adopted, not only in oil well boring but in all artesian drilling. Mr. Drake was the first to try this method, putting down a tube thirty-six feet where it struck the rock. Drilling then commenced and proceeded slowly under the direction of "Uncle Billy" Smith and his two sons, until the bore had penetrated the rock thirty-three feet, when, on Saturday night, August 27, the drill dropped into a crevice about six inches. The tools were pulled out and put aside for the work to be resumed on Monday. But, Sunday afternoon, Smith visited the well to make sure that all was safe, and, on looking down the pipe, saw liquid within a few feet of the top. He dipped up a little and found it to be oil. They had reached petroleum in the first sand, at a depth of thirty-three feet through the rock and sixty-nine and one-half feet below the surface of the ground. When the pump was started on Monday the well produced at the rate of twenty-five barrels per day, at that time an incredible quantity. They had hoped for gallons and found barrels of the precious fluid.

DEVELOPMENT SINCE 1859.—The success of Drake's well ushered in a period of almost unparalleled excitement, surpassed only by the gold fever of California ten years before. Mr. Bissell was notified by telegraph that oil had been found, and quietly bought up most of the stock of the Connecticut corporation before the news was generally known. The value

of the product had already been established by the tests of Professor Silliman and others, and the possibility of making burning oil from it had been demonstrated at a number of refineries. The need of an illuminant had long been felt—the decadence of the whale oil industry, through the extermination of the whales, having forced the production of illuminating oil by the destructive distillation of coal imported from England and Nova Scotia; but the kerosene so made was very far from satisfactory, on account of its pungent odor and tendency to smoke when burning. However, several large works in the vicinity of New York city had been built at great cost, and had opened the way for the oil industry of to-day. Western Pennsylvania, in 1859 and the next few years, was the scene of indescribable activity and speculation. Wells were sunk, in great numbers, along Oil creek, French creek and the Allegheny river. Adventurers flocked thither from all parts of the country. What was soon known as the “oil region,” was transformed from an almost unbroken forest into camps and towns.

Many of the wells yielded nothing, others lasted but a short time, while some gave enormous quantities of oil. As the producing fields changed, the population shifted with the fields, and the towns that had sprung from the wilderness as by the touch of a magician’s wand, vanquished almost as quickly as they had grown. Pithole City, for example, in 1865 next to Philadelphia the largest post office in the state, has now entirely disappeared and the site of the city become a farm. Crew describes this period in his *Practical Treatise on Petroleum*, very graphically:—

“At or about this time a visit to this wild section of western Pennsylvania was full of interest, and to any one who could cheerfully put up with the rude accommodations the place offered, and with the still ruder manners of the wild adventurers who thronged there from every point of the compass, the trip was one replete with a kind of romantic enjoyment, novel and strange. For miles around in every direction the tourist was never out of sight of the derrick, the puffing engine, the huge piles of barrels and the enormous iron tanks filled with oil. Temporary tramways were stretched in every direction to facilitate the movements of the oil. Immense teams of mules or horses were employed in the transportation of the oil from the wells, either to the nearest railroad station or to the flat boats on Oil creek. The surface of the whole country was saturated with oil from the leakage of the barrels, the overflow and enormous wastage from the wells before they could be got under control, and from the leakage and bursting of tanks. The peculiar odor of petroleum prevaded everything; the air for miles was thoroughly saturated with it; nothing else was thought of; nothing else was talked about. Land was sold at thousands of dollars per acre. Fortunes were, literally and without exaggeration, made and lost in a day. Oil companies with high-sounding names were organized almost without number, absorbing millions of money; many companies were formed without the shadow of basis for operations; and hundreds who were as covetous as they were ignorant were drawn in the maelstrom of speculative excitement and hopelessly ruined.”

We give elsewhere a table showing the quantities of oil produced each year. From this it will be seen that, by the end of 1859, fully 200 wells were in successful operation and the production of crude oil amounted to 2,000 barrels. Phenominal growth then followed. Next year the production was 500,000 barrels, and in 1861 it had increased to 2,113,609 barrels. In addition to this amount, it is estimated that at least 10,000,000 barrels ran to waste because of lack of barrels to hold it or a market to take care of it. Peckham speaks briefly of the territory developed:—

“The territory over which operations were conducted was for a long time confined to the valleys of the Allegheny river and its tributaries, on the supposition that the present configuration of surface was related to the strata containing the oil. For this reason wells were drilled in the valley of Oil creek from Titusville to Oil City; on French creek, from Union City to Meadville and Franklin; and, on the Allegheny, at Tidioute. Although the coal oil manufactories all over the country, with scarcely an exception, commenced to work petroleum instead of coal, the production was so enormous, as compared with the demand, that the market was soon glutted and the price fell to almost nothing.”

Henry, in *The Early and Later History of Petroleum*, describes the increase of production as follows:—

“The total daily product of all the wells in June, 1860, was estimated at 200 barrels. By September, 1861, the daily production had reached 700 barrels; and then commenced the flowing-well period, with an addition to the production of 6,000 or 7,000 barrels a day. The price fell to 20 cents a barrel, then to 15, and then to 10. Soon it was impossible to obtain barrels on any terms, for all the coopers in the surrounding country could not make them as fast as the Empire well could fill them. Small producing wells were forced to cease operations, and scores of operators became disheartened and abandoned their wells. The production during the early part of 1863 was scarcely half that of the beginning of 1862, and that of 1864 was still less. In May, 1865, the production had declined to less than 4,000 barrels per day.

“Commencing at Titusville in 1859, the tide of development swept over the valley of Oil creek and along the Allegheny river above and below Oil City for a considerable distance; then Cherry run, in 1864. Then came Pithole creek, Benninghoff and Pioneer run; the Woods and Stevenson farms, on Oil creek, in like succession, in 1865 and 1866; Tidioute and Triumph hill in 1867, and in the latter part of the same year came Shamburg. In 1868, the Pleasantville oil field furnished the chief center of excitement.”

Space cannot be spared to follow the development of the different oil fields further than to make very general mention of each of them as they have in turn appeared. During the first two years, after the success of Drake, the search for oil was restricted to the territory around Titusville, wells being sunk up and down both sides of Oil creek and back on the hills that form its banks. The drills were then tried on the Allegheny river, and its shores were found to yield abundantly. It was not unnatural, though not very logical, for the petroleum seekers to feel that there must be some connection between the trend of Oil

creek and the Allegheny river and the underground deposits of oil. As it happened, the oil-bearing strata extended generally under these two streams, but a glance to-day at a map showing the location of all the oil fields that have been discovered will demonstrate to the eye the fallacy of this belief, as the fields in some instances stretch across the Allegheny river at right angles.

Up to this time all of the oil secured had been lifted from the wells by pumps. A new surprise was now in store for the producers. The first flowing well was struck in February, 1861, on the McElhenny farm, yielding 300 barrels per day. It flowed for fifteen months. This surprise had not spent itself, when the Phillips well was struck, shooting forth ten times as much oil per day as the first well, and was followed soon by the Funk well matching the Phillips in productiveness, giving 3,000 barrels per day; the Noble well, with 3,000 barrels per day; and the Sherman well, with 2,000 barrels per day. Crew is authority for the statement that the Noble well produced upwards of \$3,000,000 worth of oil, and that the Sherman well flowed an average of 900 barrels per day for two years.

Such a stimulus as the finding of these gushers, or petroleum fountains, following one another in quick succession, increased the production enormously; for not only did the large wells add to the quantity produced, but the success in striking them encouraged prospectors generally to renewed efforts for obtaining capital for further developments. The production in 1861—a little more than 2,000,000 barrels—was increased fifty per cent. in 1862, to 3,000,000. As a natural consequence, prices rapidly declined. Henry, in the quotation already given, speaks of ten cents per barrel as the lowest limit; but we believe five cents per barrel was the price actually touched in November, 1861.

A fresh surprise was still in store for the oil operators; when it was found that productive territory need not necessarily underlie the valleys and river bottoms, but that the high lands also covered the hidden treasure. In 1862, the drillers became crowded in following the banks of the Allegheny river, and pushed back into the adjacent country. They had already climbed the hills bordering Oil creek and the Allegheny river, but now tested the high plateaus of Clarion, Butler, Armstrong, McKean and Warren counties. In 1864, the Economy well and the surrounding region in Warren county, and the Pithole division in Venango county became prominent.

The Venango oils had been dark green to black; the new wells gave a beautiful amber colored product. The Pithole division reached its maximum productiveness in 1866. The Allegheny field of dark green, almost black, and heavy gravity, oil appeared in 1867. The Tidioute and Armstrong fields was found in 1868. In this same year the production about Parker in Clarion county also became known. The Butler-Clarion belt was discovered in 1870. This opened up what was afterwards known as

the Lower or Southern field, oils of lighter color and higher gravity ; a territory of remarkable richness, that has continued even to to-day, standing second only to the great Bradford district in quantity of oil produced. The wells are from 900 to 1,300 feet deep, and the oils of a reddish amber color.

Much of this extension of the oil region was carried out on lines developed by C. D. Angell and others, who formulated "belt theories" which they thought would enable them to successfully locate the subterranean deposits. Angell made a study of the relative location of the largest wells. In the Titusville group a narrow strip of country running in a direction a little east of north, took in all the most productive ones. It is strange that the fact had not been noticed before. When the lower country was discovered, he quietly mapped out a similar field in Clarion and Butler counties, parallel to the Titusville one, and secretly secured leases of much of the territory. His success was patent, and others were led to see that he worked with method which they soon copied. The plan was somewhat more scientific than that which had been followed in developing the territory along Oil creek and the Allegheny river ; and yet, wildly tracing a line by the direction of a compass and hoping to find productive territory after passing miles of untested country, is almost superstitious. Even if the trend of the oil-bearing strata has been found, and there is reason to believe that the same strata extend under untried territory ; still, when we remember that the slightest variation from the true angle at the start soon becomes an error of miles when carried to a distance, we see the futility of the plan. Besides, nature's lines are seldom straight. The oil-bearing sands are undoubtedly deposited in curves and in beds at intervals only. This is now recognized, and the oil leads are traced by means of the drill, without any reference to the topographical conformation of the surface.

A Northern district next claimed from the Middle and Southern a share of public attention, when the Bradford field was found. The date generally given is that of December 6, 1874, when a well on the Buchanan farm, two and one-half miles from the town of Bradford, was struck by Butts & Foster. But as early as 1862, the Barnesdall well had been put down to a depth of 200 feet and abandoned because no oil was found. Three years later, F. E. Dean went down 900 feet and gave up the search. In 1866, a number of persons joined in sinking the Barnesdall well to 875 feet, and having gone considerably below the level of oil in Venango county, the work was stopped. James E. Butts first reached the Bradford stratum of producing sand, going down 1,110 feet in 1871 ; but, as only ten barrels per day was secured, it was thought oil in paying quantities could not be obtained. The well on the Buchanan farm, finished in 1874, yielded 70 barrels per day. In 1875, the production was fully 25,000 barrels ; in 1876, it had increased to 380,000 barrels ; in 1877, to 1,450,000 barrels ; in 1878, to 6,500,000 barrels—

as much in a day as was produced in a whole year in 1875. In the following year the production was again doubled, and brought up to 14,200,000 barrels. In 1880, it was 22,300,000 barrels; in 1881, over 23,000,000 barrels. The production of all the other Pennsylvania fields in that year was only 4,238,000 barrels, the Bradford production being six-sevenths of the whole. The surprising feature of this yield was not the size of the wells, for they did not average one-tenth that of the Venango county wells, but the uniformity and steadiness with which they offered their treasure. Peckham, giving Dr. Ashburner as his authority, states that up to 1880, out of 6,249 wells drilled in the Bradford territory, only 3.77 per cent. proved dry holes; while one-fourth of the wells put down in the Venango sands, from their discovery in 1859 to 1880, yielded nothing. The Bradford wells are very deep, some going down more than 2,000 feet. The oil is dark in color and quite heavy in gravity.

It was in connection with this field that the producing territory was found to stretch over into Cattaraugus county, New York; but, as stated elsewhere, it has not been practicable to distinguish between the oils obtained in New York and Pennsylvania. In 1889 and 1890, careful estimates were made of the proportion of the Bradford field production secured in New York, and it was found to be about $26\frac{1}{2}$ per cent. of the total. This then included the Allegany and Richburg production; which, in fact, largely exceeded the regular Bradford production in New York, 18 per cent. out of the $26\frac{1}{2}$ per cent. having been Allegany oil.

In 1875, the Bullion and Warren oils appeared. In 1876, the Beaver district of Clarion county became prominent. In June, 1879, oil was found in the Richburg field in Allegany county, New York; closely allied, so far at least as location is concerned, with the Bradford territory. The first well was put down as a "wild cat" or test well, and produced at the rate of four barrels per day, hardly foreshadowing the enormous output soon to follow; for, in 1881, it had reached 600,000 barrels; and, in 1882, 6,450,000 barrels.

In 1880, the Clarion and Warren productions became a feature in the calculations of the producers. They yielded beautiful amber oil, as light as 48° gravity. They were both the result of "wild cat" ventures. A "wild cat" well is one that is put down to test new territory, regardless of supposed geological connection with known territory. In May, 1882, the Cherry Grove oil made its appearance of sudden growth and of almost as sudden decline. Found in May, it yielded in July over 24,000 barrels per day; but, in October, less than 9,000; the average, for 1883, being only 2,000 barrels per day, which fell to 400 the following year.

In September, 1884, the Thorn creek oil was secured; the great Phillips well, the largest flowing well ever opened in America, starting at the rate of 10,000 barrels per day, which gradually declined to 500 barrels. Crew publishes in his work on petroleum a letter about this well

from F. H. Taylor of Oil City, editor of the *Derrick Hand-Book of Petroleum*. The letter was written only three months after the well was struck, and can, therefore, be accepted as accurate:—

“This well was drilled through the sand October 25 and 27, 1884, and being filled with salt water, it made no show of oil. It was ‘shot’ October 27. The owners were not expecting a large well, and consequently were not prepared for it. The result of the torpedo was that the well began flowing at a rate estimated from 400 to 500 barrels per hour. All this oil flowed on the ground for six hours, so that it is impossible to more than estimate its production for that time; but I think it safe to say that in some one hour of that time it made 500 barrels, or, at that rate, 12,000 barrels a day. About dark they got part of the oil turned into a tank; and, with a gauge, and an estimate of what was being lost, made its production at that time 130 barrels an hour. We generally call its first day’s production 7,500 barrels, because that was all that was saved from it; but its actual output was undoubtedly 9,000 to 10,000 barrels and may have been more.”

In 1885 and 1886, the production in Washington and Greene counties became prominent. During these two years the number of wells put down was greatly increased; the total for 1886 being 3,478, the largest number for several years. The stocks of crude continued to be so large as to occasion general alarm among producers. The largest stock on record is that of August 31, 1884, a total of 39,084,561 barrels. The average stock of 1884 was 35,953,975 barrels; of 1885, 37,698,481 barrels; of 1886, 35,732,291 barrels. The early part of 1887 showed little decrease in production; and prices, with some minor fluctuations, steadily declined. In August, 1885, crude was quoted at \$1.04 per barrel; in January, 1886, it had declined to 90 cents. It averaged for December, 1886, only 71 cents; having several times during the year fallen below 65 cents. The bottom price of 54 $\frac{3}{8}$ cents was touched in July, 1887; the average for the month being only 59 $\frac{1}{4}$ cents. A plan was formulated at this time by the producers looking to curtailing for a time the output of the oil fields. An agreement was drawn up and signed by the members of the Petroleum Producers’ Association beginning: “Whereas there has accumulated the past ten years an excessive stock of crude petroleum, which is deteriorating in quality, and a portion of which each year becomes sediment, valueless for any purposes, and the carrying of which excessive stock requires the expenditure of vast sums annually; and whereas, in consequence of the existence of such stock, the price of crude petroleum has, for the past year, been largely below the cost at which the same was produced, etc.” By this agreement, about one-quarter of the production, or at least 17,500 barrels per day, and as much more as possible, was to be “shut in” for one year, beginning November 1, 1887. The movement was a success. The average daily production of the three months ending October 31, was about 64,000 barrels; that for the following three months only 41,000 barrels, a reduction of 23,000 barrels per day. The agreement was to stop cleaning out

and torpedoing all wells for one year and to shut in a certain part of the production of the other wells. In 1888, the production was only 16,488,668 barrels; while it had been, in 1887, 22,356,193 barrels. The stock reported for October 31, 1887, of 30,662,583 barrels was reduced to 18,995,814 barrels by December 31, 1888; and the average price of certificates advanced from about 67 cents in September, 1887, to 93 cents in September, 1888; the average for the year 1888 being 87 cents, as compared with 66½ cents for the year 1887.

In 1889, production was again resumed and 5,435 wells were completed, as compared with only 1,515 in 1888, and 1,660 in 1887. In January, 1888, there were but 64 wells going down; while in January, 1889, there were 341. The average for 1889 was 548 wells, as compared with that for 1888 of 136. The year 1890 shows the largest number of wells ever completed in any one year, a total of 6,358.

The phenomenal McDonald field appeared in 1891. Scarcely one-half the number of wells was completed this year as in the year before; yet the production and stocks increased over 5,000,000 barrels, because of the extraordinary average production of the wells. The average for the year was 58.90 barrels, while during October it reached 201.54 barrels. In consequence of this great increase in production the premium which had been paid on much of the crude produced, making its price from 20 to 25 cents above the certificate quotation, was removed. The McDonald field began to decline in the latter part of 1891 and continued to decline through 1892. In that year the production of the Sistersville field took its place to a considerable extent, but the low prices prevailing have not encouraged the search for new fields.

MINING OF CRUDE PETROLEUM.

Classification of Producing Territory—Origin of Petroleum—Oil Wells and Tools—
Cost of Wells—Torpedoes—Flooding.

When Prof. S. F. Peckham published his report for the Tenth United States Census, he classified the production up to December 31, 1880, under ten divisions or districts:

	<i>Barrels.</i>
Oil Creek division, including Shamburg, Pleasantville and Enterprise,	35, 517, 217
Pithole district, including Holderman, Morey and Ball farms,	4, 816, 298
Central Allegheny division, including Scrubgrass to West Hickory,	6, 482, 900
Lower Allegheny division, including Butler and Armstrong counties,	37, 342, 978
Tidioute district, including Economites, Henderson farm, etc.,	4, 674, 345
Clarion district, including Clarion county,	20, 381, 638
Bradford district, including McKean and Elk counties; also Cattaraugus and Allegany counties, New York, . .	44, 574, 921
Bullion district, including Venango county,	2, 312, 190
Warren division, including Stoneham, Clarendon, etc., . .	448, 213
Beaver division, including Smith's Ferry, etc.,	339, 631
	<hr/>
Total production from all districts,	156, 890, 331

His recapitulation above covers the entire production of crude petroleum from the discovery of Drake's well to January 1, 1881. It is interesting to look at the changes in the quantities produced in each field each year. We, therefore, give elsewhere his figures in detail. (See page 86.)

Six years later, the Second Geological Survey of Pennsylvania (1886) brings the production down to January, 1883. A comparison of the distribution given in that report with that of the Tenth United States Census shows that while the figures of total production vary but slightly, the distribution among the several fields is somewhat different. The Central Allegheny division is now called the Butler and Armstrong division, and a new field has been added in the Allegany county division, New York

	<i>Barrels.</i>
Oil Creek division,	33, 262, 000
Central Allegheny division,	7, 260, 000
Tidioute and Fagundus division,	9, 860, 000
Beaver and Smith's Ferry division,	904, 000
Pithole and Cashup division,	3, 378, 000
Butler and Armstrong division,	39, 934, 000
Clarion division,	21, 827, 000
Bradford division,	85, 866, 000
Warren and Forest division,	4, 196, 000
Bullion division,	2, 541, 000
Alleghany county division, New York,	7, 055, 000
Total barrels of 42 gallons,	<u>216, 083, 000</u>

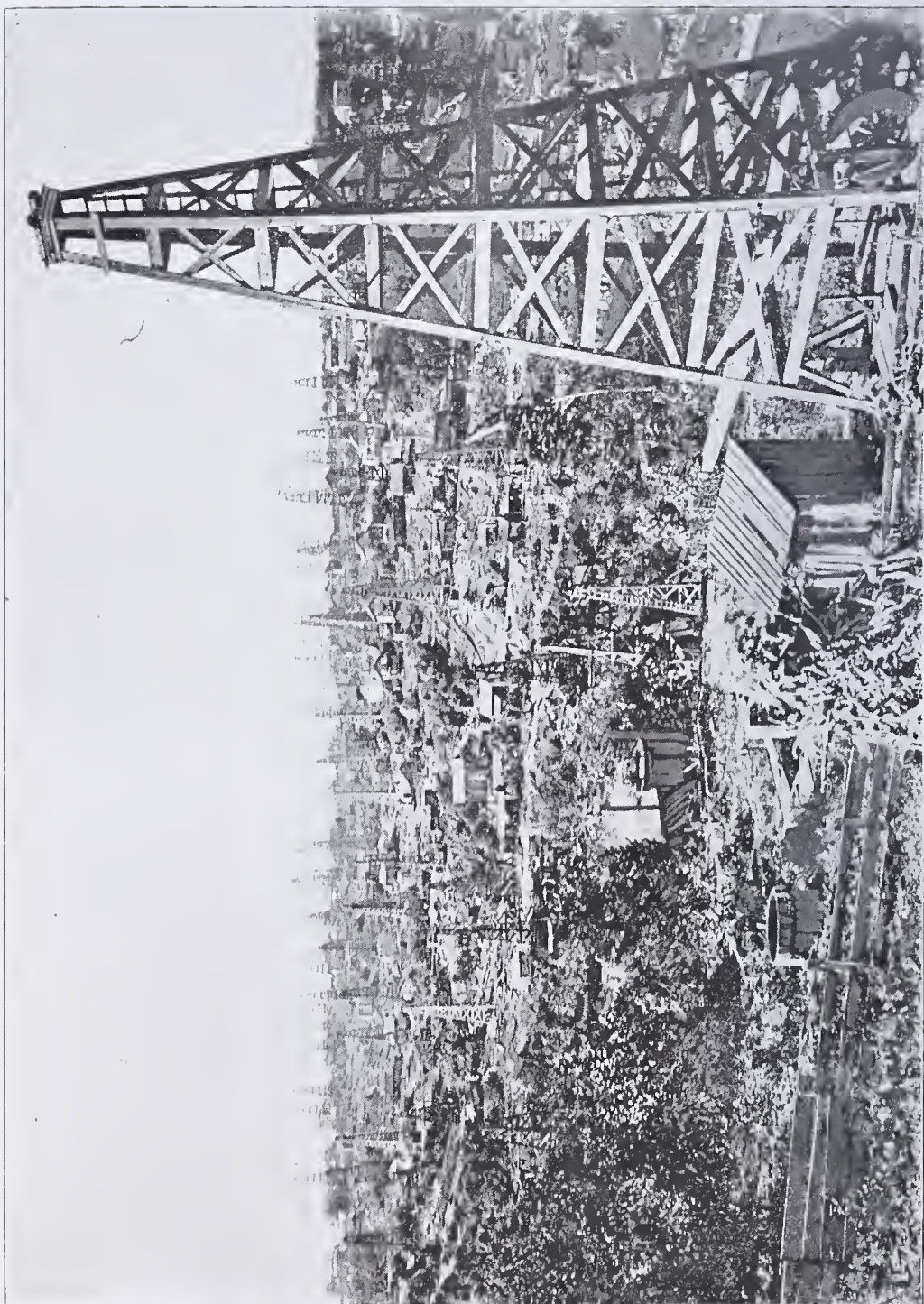
We give this table also elsewhere in detail. (See page 87.)

The United States Geological Survey for 1888, gives the production for that year by districts as follows:

	<i>Barrels.</i>
Bradford and Alleghany,	6, 284, 375
Forest,	204, 250
Warren,	1, 865, 366
Butler,	3, 478, 387
Bald Ridge,	1, 220, 054
Tidioute,	660, 328
Washington,	2, 322, 190
Greene,	9, 528
Mt. Morris,	79, 279
Nineveh,	4, 227
Shannopin,	301, 906
Brush Creek,	54, 778
Total,	<u>16, 484, 668</u>

The United States Geological Survey for 1890, classifies the production for that year according to fields as follows:

	<i>Barrels.</i>
Bradford district, Pennsylvania and New York; and Alleghany county, New York,	7, 158, 363
Forest county,	258, 955
Warren county,	2, 347, 434
Butler and Clarion counties, etc.,	5, 358, 403
Tidioute and Titusville,	885, 119
Allegheny county,	541, 092
Beaver county,	602, 736
Washington county,	3, 848, 145



BRADFORD OIL FIELD.

	Barrels.
Greene county,	392, 912
Franklin district,	65, 276
Smith's Ferry district,	29, 000
	<hr/>
Pennsylvania and New York,	21, 487, 435
	<hr/>

We have brought these statistics together here, somewhat out of their regular order, to show the difference in general classification employed at different times, owing largely to the shifting of the producing fields.

At one time an effort was made to classify oils according to the sands from which they came; namely, first sand, second sand, and third sand, crude—meaning by this nomenclature the geological rock stratum from which the oil was drawn. This plan was soon found to be impracticable. Not only was it difficult to determine from which sand different wells were obtaining their supply, owing to the lack of intelligence and care on the part of those sinking them, but other sands than those thus numbered in the early days of well-boring, appeared in the later borings. It soon became clear that geographical distribution was more satisfactory than geological.

The late Dr. Charles A. Ashburner, geologist in charge of the Pennsylvania Survey of 1884, classified all the producing wells of that year under four general heads: Northern, Middle, Southern and Miscellaneous fields.

The common classification of to-day recognizes, likewise, four general divisions: Bradford, Middle, Lower, and Washington or South-western districts.

1. *Bradford*—The main field lies in the northern part of McKean county, but extends several miles into Cattaraugus county, of New York State. It also includes the large field of Allegany or Richburg oil lying wholly in Allegany county, New York; and the Carrollton production of Cattaraugus county, New York. These are detached basins of oil rock, separated by several miles from the main producing territory; the former to the northeast, and the latter to the northwest, of it. The large wells of the Kinzua district, lying southwest of the main field, and the small wells of the Windfall Run district, lying to the west of the main field, both in McKean county, are classed with Bradford. The oil of this field is dark amber green to black, and of heavier gravity than that of the other fields.

2. *Middle*.—This includes particularly the production of Warren and Forest counties, with the exception of a few pools in the southwestern corner of the former and the western end of the latter. The Stoneham, Cherry Grove, Clarendon, Tiona, Kane, Grand Valley, Balltown and Cooper oils belong to this division. The crude is generally of an amber shade, but varies greatly in different parts of the field both in color and gravity.

3. *Lower*.—This includes all the production of Venango, Clarion, Butler, Beaver and Lawrence counties. It is a field of great extent and embraces a great variety of oils, from the heavy dark oils of the Franklin and Smith's Ferry districts to the high gravity, lighter-colored oils of the Parker district. The oils are green to black in color and of light gravity.

4. *Washington or Southwestern*.—This includes the production of southwestern Pennsylvania, particularly in Allegheny, Washington and Greene counties; the Turkey Foot and other oils of West Virginia, and the Macksburg production of southwestern Ohio, are also included in this general field in statistics prepared to show the total production of what is termed Pennsylvania crude, in distinction from the sulphur-charged crudes of Ohio. The oils are a reddish amber in color and of light gravity.

A brief reference should here be made to the geological location of petroleum in Pennsylvania. Prof. S. F. Peckham, after a careful compilation of most of the data on the subject in existing literature up to 1880, summarizes the results:—

“According to the latest published researches, I conclude that the geological formations in western Pennsylvania, from which petroleum has been obtained, belong to the Chemung and, perhaps, later groups of the Upper Devonian, and consist of shales and marls interstratified with sandstones. The sandstone varies in character from a coarse-grained uncemented sandstone to a pebble conglomerate, composed of worn pebbles of white or slightly colored opaque quartz overlaid by marls and slates, often highly silicated, forming very hard and impervious crusts. This pebble conglomerate consists of two varieties, occupying separate horizons, in one of which the pebbles are nearly spherical and in the other flattened. Between these beds of sandstone or conglomerate that contain the oil are beds of shale, often of great thickness, with which are thin beds of sand and shells The sandstones and conglomerates are of quite uniform structure over wide areas; for instance, the Venango third sand consists of smooth, rounded pebbles, while the Bradford third sand is a porous sand stone.”

His final conclusion is that Pennsylvania crude “occurs, saturating the porous portions of formations that lie far beneath the influence of the superficial erosion, like sandbars in a flowing stream or detritus on a beach. Their formations or deposits, taken as whole members of the geological series, lie conformably with the enclosing rocks and slope gently toward the southwest. The Bradford field in particular resembles a sheet of coarse-grained sandstone, 100 square miles in extent by from twenty to eighty feet deep, lying with its southwestern edge deepest and submerged in salt water, and its northeastern edge highest and filled with gas under an extremely high pressure.

“It is further to be concluded that, from whatever source the petroleum may have originally issued, it now saturates porous strata, not of any particular geological age, but runs through a vast accumulation of sediments from the oldest to the newest rocks in Pennsylvania and West Virginia, embracing all the rocks between the Lower Devonian and the Upper Carboniferous.”



VENANGO OIL FIELD.

The most exhaustive and probably most valuable treatise on the geology of Pennsylvania petroleum is the admirable report of John F. Carll, to the geologist in charge of the Second Geological Survey of Pennsylvania, published in 1880. He describes the difficulties under which a geologist works when attempting a study of the subject:—

“In the first oil development by artesian wells, nothing was known about the sands. Wells were drilled until indications of oil appeared, without regard to the character of the strata pierced. But experience soon proved the sand rock to be its source, and then commenced deeper drilling for other sands, which, in the valley of Oil creek, resulted in the discovery and classification of three sands, these being all the oil bearing sands found in that locality, even after several wells had been sunk much deeper in quest of others.

“In the progress of development, locations for wells were selected on higher ground. The drill passed now through four or five other and higher definite sand rocks before reaching the geological horizon of the first sand of Oil creek, and when this fact was made clear, it became customary among drillers to throw out these upper sands from their well records. They were called the mountain sands, and were also numbered 1, 2, 3, etc. The drillers commenced their count of the oil rocks with that one which they found at the depth at which they supposed the first sand of Oil creek to lie; but in so doing, many errors occurred, resulting from a want of accurate observation, first, as to the surface elevation of the wells drilled on high ground, and second, as to the dip of the oil-bearing strata, which materially affected the comparison of elevations, even when these were accurately known. A third source of error may be found in the fact that a thick stratum of sand lying single and solid in one place, is often split into two, or, in other words, is represented by an equivalent of two sands with shales intervening in another place, perhaps only a short distance from the first.”

He speaks specifically of the three sands in which crude petroleum is found:—

“A comparison of records of wells on Oil creek, where the three leading sands of the petroleum measures lie with considerable regularity, both as to their thickness and the intervening distances between them, results in an average record about as follows: First sand, 40 feet thick; interval, 105 feet. Second sand, 25 feet thick; interval, 110 feet. Third sand, 35 feet thick. Total, 315 feet.

“In addition to these three regular sands, there is found in many of the wells a fine-grained, muddy, gray sand known among drillers as the ‘stray third.’ This lies from 15 to 20 feet above the regular third, and is from 12 to 25 feet thick. In some localities this rock assumes a pebbly character, and produces oil which is always darker than the third-sand oil, sometimes being nearly black.

“At different points on Oil creek, at Shamburg and other places, wells in close proximity to each other have been produced, some of them, black oil, some green, and some a mixture of both.”

His careful study leads him to conclude that the whole oil field of western Pennsylvania, from Pittsburg to Lake Erie, constitutes a group of oil sands, above which lie 300 or 400 feet of soft formation everywhere, and below which there is another mass of soft shale. Between these two are to be found the oil sand deposits to 300 to 380 feet thick.

This he designates as the Venango group. It does not include the Warren or Bradford oil sands which are older and therefore deeper.

Dr. Charles A. Ashburner, in his *Geology of McKean County*, gives an excellent comparison of the oil sands of the different fields:—

“The Bradford sand consists of a gray and a white sand of about the same coarseness as the ordinary beach sand of the Jersey coast; compact yet loosely cemented. The average thickness of the sand is about 45 feet, and from top to bottom the sandy strata change but little in their general character. It is only when specimens from the successive layers are placed side by side and closely examined that any difference in structure can be recognized. The grains of sand are regular, vary but slightly in size, color and the quantity of cementing material which holds them together in their rock bed. The same homogeneousness which characterizes the vertical section is found to exist over a considerable horizontal area. In fact but little change is found to exist in the sand obtained from wells fifteen miles apart, or in the sand from intermediate wells The characteristics of the Venango sands are quite different A productive Venango sand consists of a white, gray or yellow pebble rock, the pebbles being loosely cemented together and generally bedded in fine sand. The rock is open and porous. The interstices between the pebbles and the sand grains are extensive and capable of containing a large bulk of oil; but this character does not maintain itself over any extended area. Areas of such sand are small and scattered and are separated by sand beds, possessing a character belonging to the unproductive sands. The Venango sands are not homogeneous over any considerable area and are frequently very heterogeneous in section. The thickness of the sand varies; in one locality the upper part of the sand may be pebbly and of productive character and the lower part fine and contain no oil, while but a short distance away the conditions may be reversed.”

He classifies the fields, and describes the sands and oils produced as follows:—

“NORTHERN OIL FIELD.

Black Sand.

Oil sand, fine grained, friable, very seldom containing pebbles as large as pin heads. Color, black, dark brown or chocolate brown; hence compared to coffee grounds; chocolate or ashes from red-ash coal.

Oil, dark amber, green, occasionally black. Gravity heavier than oil from Venango third sand.

MIDDLE OIL FIELD.

White and Gray Sands.

Oil sands irregular in their geological relations, as well as in composition and color; generally grayish and fine-grained, but sometimes white, coarse-grained and pebbly in streaks; oils, amber, ranging from dark amber to light amber, with considerable variation in gravity.

SOUTHERN OIL FIELD.

Venango Oil Sand Group.

White, grayish white and yellowish sand-stones, generally friable and coarse-grained, and frequently true conglomerates with water-worn quartz pebbles as large as hazelnuts. Oils, green, black, and in some cases amber. Gravity ranging from 30° to 51° B. Third sand oil 48° B.

MISCELLANEOUS.

Oil from sand-stone above Venango group."

Carll's comparison is even more concise:—

"The 'Venango Third Sand' is a coarse pebble-rock associated with a clean white sand; the 'Warren Third Sand' is fine-grained, bluish grey and somewhat muddy; the 'Bradford Third Sand' is of medium grain, friable, but sometimes almost floury, and of a decided brown or snuff color."

ORIGIN OF PETROLEUM.—The problem of the origin of petroleum is far from settlement. There is satisfaction, therefore, in noting such facts as are accepted without dispute. The sands in which oil is found are undoubtedly of sedimentary origin. They lie at the top of the Devonian system, having been deposited while the Devonian was merging into the Carboniferous. The composition of the sands varies so widely, from the coarsest pebbles down to the finest mud rock, all the intervening grades of conglomerates being found, that the manner of deposit, whether in river, lake or ocean, by river, shore or deep-sea currents, has not been determined. Carll eliminates the theory of river deposits and inclines to the belief that the sands are shore-line or sea-coast accumulations, wisely attempting no proof, and, like a true scientist, simply presenting the facts as he finds them.

Aside from the problem of the oil-bearing sand, we have the still more difficult one of the genesis of petroleum itself. Where and when was it formed? Is it indigenous to the rock in which it is found, or has it been condensed in those rock, having come up in the form of gas or vapor from deeper strata? In either case, is it the result of chemical reaction or of distillation by heat; and if so, is it the result of fractional or destructive distillation; and, finally, is the oil, however generated, of animal or vegetable origin, or of both? We can hardly hope to answer these queries, when the ablest scientists, after years of research and experiment, have left them unsolved.

The theory of the chemical origin of petroleum is, in many points, less in accord with observed facts than the other theories mentioned. It was first presented to the consideration of the scientific world by a French chemist, Berthelot, in 1866, and brought into prominent notice in 1877 by a paper read by Prof. Mendeljeff before the Chemical Society of St. Petersburg. We quote from a resume of this paper as giving briefly the basis of the theory:—

"In speaking of the hypothesis of La Place upon the origin of the earth, in applying Dalton's law to the gaseous state in which all the elements constituting the terrestrial globe ought to be found, and taking into consideration their relative densities, M. Mendeljeff recognizes the necessity of admitting a condensation of metals at the center of the earth. Among these it is natural to presume that iron would predominate, because it is found in great abundance in the sun, in metecrites and basalts. Admitting further the existence of metallic carbides, it is easy to find an explanation, not only for the origin of petroleum, but also for the manner of its appearance in the places where the terrestrial strata, at the time of their elevation into mountain chains, ought to be filled with crevices to their center. These crevices have admitted water to the metallic carbides. The action of water upon the metallic carbides at an elevated temperature and under a high pressure has generated metallic oxides and saturated hydrocarbons, which, being transported by aqueous vapor, have reached those strata where they would easily condense and impregnate beds of sand-stone, which have the property of imbibing great quantities of mineral oil."

J. P. Lesley, in his letter transmitting the report of 1880 on the survey of the oil region, criticises this theory:—

"The chemical theory, so called, which looks upon petroleum as condensed from gas, the gas having been previously distilled from the great black shale formations (Marcellus and Genessee) must face the objections that such a process, if chemically possible, which is doubtful, ought to have distributed the oil everywhere and permanently blackened and turned into bituminous shales the entire thickness of this part of the earth crust for several thousand feet. It fails to explain the petroleum obtainable from the Cannel coals and from roof shales of bituminous coal beds. And it fails also to explain the entire absence of petroleum from immense areas of not only shales, but sand and gravel rocks, equally underlaid by the Marcellus and Genessee formations."

Prof. S. F. Peckham claims that there is overwhelming proof that the Pennsylvania oils are of vegetable origin:—

"Pennsylvania petroleum was examined in 1865 by Warren and Storer in this country, and in 1863 by Pelouze and Cahours in France, who found the lighter portion to consist of a certain series of hydrocarbons, identical with those obtained in the destructive distillation of coal, bituminous shales and wood, when the operation was conducted at low temperatures. * * *

"The section compiled by Mr. Carl shows the Devonian shales above the corniferous limestone and below the Bradford third oil-sand, to be 1,600 feet in thickness. This shale outcrops along Lake Erie, between Buffalo, New York, and Cleveland, Ohio. It is for the most part the surface rock in the neighborhood of Erie, Pennsylvania, and southward to Union City, and no one can examine it without noticing the immense quantity of fucoidal remains that it contains. Prof. N. S. Shaler discusses in much detail the extent and character of the Devonian black shale of Kentucky, and estimates it to cover 18,000 square miles at an average depth of 100 feet, and to yield on distillation fifteen per cent. of fluid distillate. It is not necessary to follow him in his calculations of the enormous bulk of this distillate as represented in barrels; the important point in this connection is that it is a very persistent formation, being revealed by borings over a very wide area, and doubtless extends

beyond the boundaries of Kentucky, eastward beneath the coal measures which contain the petroleum."

J. P. Lesley, in charge of the Second Geological Survey of the State, in his letter transmitting the report of the survey of the oil regions for 1880, inclines to the belief that primordial animals, as well as submarine plants, are the basis of petroleum:—

"The origin of petroleum is still an unsolved problem. That it is in some way connected with the vastly abundant accumulations of Palæozoic sea weeds, the marks of which are so infinitely numerous in the rocks, and with the infinitude of coralloid sea animals, the skeletons of which make up a large part of the limestone formations which lie several thousand feet beneath the Venango oil sand group, scarcely admits of dispute; but the exact process of its manufacture, of its transfer and of its storage in gravel beds is utterly unknown. That it ascended rather than descended into them seems indicated by the fact that the lowest sand holds oil when those above do not, and that upper sands hold oil where they extend beyond or overhang the lower."

This naturally leads to the inquiry; was this organic matter, be it animal or vegetable, deposited with the sand now holding the petroleum? In other words, is the oil indigenous to the rocks in which it is found? There are numerous objections to this theory. When and by what means could this organic matter have been converted into petroleum so completely that there is not the least residual trace of any of the original matter, nor any indication of waste? Could it, like Prospero's pageant, all dissolve "and leave no rack behind"? Again, the long ages required for the decomposition of the carbonaceous material and formation of the subsequent strata, the expulsion of the water which must have been mingled with the deposits, the distillation to form oil—all accompanied with violent changes in temperature and in the level of the petroleum strata—making it simply incredible that the oil could be preserved as now found.

The theory that petroleum has made its way as a gas into the sand strata—which have acted as a condenser to cool and turn the gas into liquid; and, then, as a sponge-like reservoir to hold it—seems the most acceptable. Carll summarizes this theory very forcibly:—

"This hypothesis also requires organic growth to furnish materials for generating the hydro-carbons and mechanical agents to prepare the sand-bed reservoirs to collect and retain them; but the operations of the two classes of agencies need not necessarily have been synchronous nor is it requisite that the areas primarily occupied by them should have been geographically co-extensive. The carbonaceous gas-producing materials may have been brought into the Appalachian basin from various sources at different times, and by many channels, long anterior to the deposition of the sand-beds. * * * *

"When we reflect that large quantities of organic matter were stored in the limestones and shales of the immensely thick beds of the Silurian formation, that they were augmented in a later period by the contents of other rich carbonaceous deposits of Lower Devonian age, that these all now lie far below the oil sands, and that we may reasonably suppose many of them are now or have been buried at a depth which would sub-

ject them to a degree of heat competent to all the requirements of spontaneous distillation of gas, we cannot but admit, in view of the known intimate relationship and association of gas and oil, that the hypothesis of the formation of petroleum from this source is worthy at least of a candid consideration."

We have extended this review of what may seem to some a strictly scientific phase of our subject, because we are convinced that the practical value of such work and study has been underestimated. How the oil has been formed and deposited may be of little interest to the producer; until he considers that, if the oil is indigenous to the sand rock, it is simply necessary for him to trace that rock, and expect to secure oil wherever the rock can be found. If, however, the oil is condensed gas or vapor, brought from other formations, it has probably been collected since the change in level of the sand strata; and so, in addition to having to find the kind of rock requisite for oil bearing, he must also find it within what the geologists term a definite horizon; and no oil deposit is to be expected wherever the strata have been elevated too near the earth's surface, or depressed too far below it.

Another question of great practical importance is closely connected with the one we have just considered; namely, the possible limitations to the production of petroleum. It seems at first difficult to comprehend how a stratum of rock, as compact in its formation as many of the oil sands appear to be, can hold quantities of liquid so enormous. In fact, in the early days of the industry, it was generally supposed that the oil was collected, if not in streams, at least in pools in the subterranean caverns technically termed crevices. All paying wells were believed to start from such a fissure in the rock. A "crevice-searcher" was invented and patented; by which the skilled operator claimed to be able to locate these crevices, and determine their depth. Some even went so far as to profess to describe the character of the strata, as their instruments passed down the bore of the well. That there are these fissures is undoubtedly true. They often annoy the well-drillers not a little, throwing the tools out of plumb and starting a "crooked hole"; and doubtless these crevices in the sand stratum are often filled with oil: but that they are not a necessary adjunct to a paying well has been clearly shown by the rough calculation of Carll. He says:—

"If we examine a piece of oil rock brought up after a torpedo has been exploded, or some of the third sandstone taken by hand from the stratum in place and laid open to view at the bottom of a large oil shaft sunk by blasting, at Tidioute, we shall find it simply a conglomerate of pebbles seldom larger than grains of wheat, loosely held together in a matrix. At first sight it hardly seems possible for any large quantity of oil to pass into a well through the interstices between the pebbles, but experiments made in a crude way on a number of pieces of this oil rock proved quite conclusively that it is capable of absorbing and holding from *one-fifteenth to one-tenth of its own bulk of water or oil*; this, too, when the pores of the rock are more or less clogged with residuum from

the oil previously held by it, and without its being charged under pressure."

He then makes a calculation to show how easily it can be proved that even a flowing well need not depend upon a crevice for its source of supply. With a bed five or ten feet thick and a strong pressure behind the oil, it is clear that the charged pores of the sand could readily yield several thousand barrels of oil per day :—

"The diameter of an ordinary well being $5\frac{1}{2}$ inches, the circumference of the circle is, therefore, $17\frac{2.8}{100}$ inches and the area of its cross section $23\frac{7.6}{100}$ square inches. Suppose the interspaces of the oil rock to amount in proportion to its whole bulk, to only one-seventeenth, instead of one-fifteenth, or one-tenth, as we have ascertained it to be in some cases; then for every inch of depth drilled in an oil sand, by which $17\frac{2.8}{100}$ square inches of its surface is laid bare (saying nothing about the bottom area of the whole) we shall have at least one square inch of oil ducts venting into the well. A depth then of $23\frac{7.6}{100}$ inches would give $23\frac{7.6}{100}$ square inches as the combined area of the inflowing oil leads, and this equals the full capacity of the $5\frac{1}{2}$ inch hole. In other words, the aggregate sum of the pores or interspaces of a sand rock of this kind, as exposed in the walls of a well of $5\frac{1}{2}$ inches diameter, is equivalent to the area of an open crevice one inch wide, extending from top to bottom of the gravel bed, whatever its thickness may be."

This calculation will serve to account for the enormous yield of certain wells and districts. If not, a table which he gives, and which we copy, will explain the possibilities of the porous sandstone acting as a sponge to store the "lakes of oil" which the early drillers claimed existed as distinct bodies of liquid :

SUPERFICIAL QUANTITIES.

43, 560 square feet in an acre,
27, 878, 400 square feet in a square mile,
6, 272, 640 square inches in an acre,
4, 014, 089, 600 square inches in a square mile.

CUBICAL QUANTITIES.

9, 702 cubic inches in a barrel of 42 gallons,
56, 147 cubic feet in a barrel of 42 gallons.

PRODUCTION OF OIL PER ACRE.

646.53 barrels if the sheet of oil be 1 inch deep,
1, 293.06 barrels if the sheet of oil be 2 inches deep,
1, 939.59 barrels if the sheet of oil be 3 inches deep,
4, 997.68 barrels if the sheet of oil be 7.73 inches deep.

PRODUCTION OF OIL PER SQUARE MILE.

514, 779.65 barrels if the sheet of oil be 1 inch deep,
827, 559.30 barrels if the sheet of oil be 2 inches deep,
1, 241, 338.95 barrels if the sheet of oil be 3 inches deep,
3, 198, 515.20 barrels if the sheet of oil be 7.73 inches deep.
3B.-10-92.

The same kind of calculation will give some idea of the enormous quantities a given territory can yield. Carll shows by his imperfect experiment that a sand may hold one-tenth of its bulk in oil. He believes that much of the rock holds one-eighth of its bulk, and more, when it is borne in mind that the oil is under pressure. This means $1\frac{1}{2}$ inches of oil to every vertical foot of sand, equal to 1,000 barrels per acre. He states that the oil rock of the Venango crude is from 30 to 50 feet thick in the third sand, and from 15 to 30 feet thick in the other sands. Assume 15 feet only of good rock; this means 15,000 barrels per acre, or nearly 10,000,000 barrels per square mile. Nature has been bountiful in her provision.

There are many facts pointing to the theory that the oil-producing sands lie in pockets or patches surrounded by impervious rock; so that each pool forms a separate, and, to a very large extent, an independent reservoir of oil. Mr. Carll cites several instances which can be explained by no other theory:—

“Pithole was practically exhausted in 1867. Yet Cashup, only two miles to the northeast, lay undiscovered until 1871. When the latter district was tapped, it exhibited all the normal conditions of new territory, a tremendous pressure of gas and an abundance of lively oil, which attested their energy and force by a well flowing over 1,000 barrels per day.

“Shamburg was discovered several years after the Oil creek rock had been practically drained, and although not more than three miles from the world-renowned Noble well district, no direct communication has ever been traced between the two oil fields.

“Bullion, the champion district of 1877, lay with its wonderful store of oil and gas within a mile and a half of Scrubgrass, unaffected by the drainage and almost complete exhaustion of the latter six or seven years before.

“Butler and Clarion are now constantly furnishing new pools outside of previously developed areas, which show no symptoms of having been interfered with or weakened by any of the previous operations.”

OIL WELLS AND TOOLS.—Most of the people of Pennsylvania are familiar with the sight of an oil well derrick. There is probably one standing for every square mile in the state. On January 1, 1890, there were 31,768 producing wells, according to the census report for that year. Undoubtedly there were more than enough other derricks standing to bring the total up to the number of square miles, 45,255, in the entire state.

While the derrick is the most conspicuous feature of an oil well, it is not the only important part even of the portion above ground. The construction in sight, taken as a whole, is called a “rig,” being the work of carpenters. The derrick itself consists of a tall pyramidal wooden skeleton about 12 feet square at the base and 75 feet high; tapering to the top, which is about three feet six inches square. The framework is held together by girths and braced by diagonals at frequent intervals. A ladder extends from the ground to the top. This

frame structure stands on heavy timber foundations called sills. At the foot of the derrick is the bull wheel; and, at the top, the crown pulley, used for raising and lowering the tools during the progress of the drilling, and for handling the tubing and sucker rods after the drilling is finished. There is, also, near the top, another pulley for lowering and raising the sand pump, to be described later; there being a separate reel at the base of the derrick for winding up the sand-pump rope. Motion or power for drilling is communicated from the band-wheel, which is connected with the engine, to a walking beam for drilling, and afterwards for pumping, by means of the pitman. The band-wheel also furnishes the motion for running up the tools by coiling the bull rope on the bull wheel and the sand-pump rope on its wheel. The walking beam is supported by the Samson post, set in the derrick foundation.

For a complete well there is also needed a boiler and engine properly housed or protected. Often many wells are pumped by a single engine placed at some central location, communicating its motion to as many as 30 or 40 wells by means of stiff rods made of strips of wood nailed together, suspended by cords from posts at proper intervals, or supported on light frames that swing easily as the rods move forward and back. The power required is reduced to a minimum by a skillful balancing of the upstroke of the pump by means of weights placed at the end of the walking beam; the engine furnishing power to produce the downstroke only. The same result is at other points accomplished by balancing the wells in pairs, so that the pump rods of one go down as those of the other come up. By clever contrivances in the way of rocking levels, knuckle-joints, elbows and tees, the lines are carried up and down hill, and are made to turn at any desired angle. Where wooden connections cannot be made, on account of the irregular surface of the ground, several wells are sometimes connected together and worked by an endless wire rope carried for considerable distances on wheels for supports. Where more power is required than in the cases referred to above, the boiler is sometimes placed in a central location, and steam carried, through lines properly protected by some non-conducting covering or in an encasing box filled with non-conducting material, to the engines located near several neighboring wells.

In 1880, the figures furnished the census bureau show the cost of derricks to have been \$325 to \$400; and the rig-irons, such as bolts, pulleys, hooks, etc., \$75 to \$100 additional. The cost in 1890 is reported, for rigs, \$200 to \$275; and the rig-irons, \$70 to \$80 additional. We give elsewhere the full figures sent the government bureau for the census report.

With the rig built, and the boiler and engine set up, the sinking of the bore-hole or well proper can be commenced. In the early days, a wooden box called a conductor was first put down to the bed rock, through the surface clay or gravel constituting the unconsolidated de-

posit of drift lying above the upper stratum of rock. Where it became necessary to go down several hundred, instead of several, feet before the rock was reached, as is often the case in valleys, a pipe was driven down through the soft formation. This is the general practice now; the first section of a well from the surface of the ground to the first solid rock, consisting of a driven pipe eight inches in diameter, or larger. This is necessary to keep the earth from caving and choking the well, or the surface water from seeping into it and giving trouble. The drive pipe is put down in exactly the same way as piles are driven; the derrick serving as support for the pipe, and as guide for the heavy maul as it goes down. This pipe has to be cleaned out in the same manner as the bore that is afterwards carried down through the rock.

The hole through the rock is now begun. If the driven pipe is long enough, the work is started and carried on regularly; but frequently there is not room to start off with a full string of tools, as they require at least 60 feet before they can begin their work. In such cases the upper part of the bore has to be made by "spudding"; the auger, or drill, being suspended on a rope running up over the pulley at the top of the derrick, and raised and lowered by the skillful manipulation of the end of the rope in the hands of the driller, it having been first carried around the bull wheel which is kept in motion by the engine. This is continued until the regular string of drilling tools can be used. Such a string consists of the drill at the bottom to pulverize the rock. This is composed of the bit (or sharpened end of the drill), the auger stem, thirty or forty feet in length, and weighs, with the lower part of the jars, over 1,300 pounds. Next comes the sinker-bar, fifteen feet in length, which, with the upper part of the jars, weighs nearly 800 pounds. The sinker-bar is hung on the cable running up to the mouth of the well. The drill itself is not fastened directly to the cable, but to the lower part of the jars. The upper part of the jars is fastened to the sinker-bar; which, in turn, is fastened to the drilling rope. The jars are therefore the connection between the drill at the bottom and the cable above, and form very important parts of the drilling tools, and of the work they do. They are a wonderfully clever device, difficult to describe without a drawing. The upper wing of the lower part, and the lower wing of the upper part, are slotted, so that there is a play of more than a foot, by means of which a sudden blow can be given either on the upward or downward movement of the tools, as desired. The drilling is done entirely by the auger or lower section of the tools, the sinker-bar above serving simply to give steadiness to the tools by its weight. The jars are to give a blow to the auger stem on the upward stroke, to loosen the bit in case it becomes wedged in the rock it is cutting, as it frequently would do, if it were fastened directly to the cable, and the stretching of the rope would admit of the motion of the walking beam without moving the drill.

Carll's explanation of the manner in which the jars perform their work will perhaps help to an understanding of their function:—

"Suppose the tools to have been just run to the bottom of the well—the jars are closed—the cable is slack. The men now take hold of the bull wheels and draw up the slack until the sinker-bar rises, the 'play' of the jars allowing it to come up thirteen inches without disturbing the auger-stem. They watch for the coming together of the cross-heads, which will be plainly indicated by a tremulous motion communicated to the cable and by the additional weight of the auger-stem. When the jars come together they slack back about four inches, and the cable is in position to be clamped in the temper-screw.

"If now the vertical movement of the walking-beam be twenty-four inches, when it starts on the up stroke the sinker-bar first moves; it rises four inches—the cross-heads come together with a sharp blow, and the auger-stem is picked up and lifted twenty inches. On the down stroke the auger-stem falls twenty inches, while the sinker-bar goes down twenty-four inches to telescope the jars for the next blow coming up. This is the theory of the movement, but of course in practice the spring of the cable in deep wells and the weight of tools may make many modifications necessary."

The string of tools—the bit, the auger-stem and jars, with the sinker-bar—are more than sixty feet long and weigh very nearly a ton. The cable holding the string of tools runs up over the pulley at the top of the derrick down to the large wheel at its foot. Upon this wheel it can be coiled to draw the tools out of the well, whenever it is found necessary to sharpen or replace the bit, or clean the bore of the pulverized rock at the bottom. This cable is fastened at the end of the walking-beam already described. By the upward and downward swing of this walking-beam a motion amounting to two feet or more, the tools are lifted and dropped at the bottom of the hole, often 1,000 or more feet down. The connecting link between the walking-beam and the cable is the temper-screw. It lowers the tools a little at every stroke.

The pulverized rock formed by the impact of the tool is held in suspension by water poured into the well from the top until there is sufficient to impede the progress of the work. The tools are then drawn up out of the hole, and a sand-pump lowered, which, on being withdrawn, brings up with it the accumulation of broken rock and sand. Sand-pumps are of various descriptions, but in general consist of a cylinder with a valve in the bottom.

We have made no effort to describe the innumerable minor appliances found serviceable in well-drilling. It would almost be an "endless task to describe and illustrate the thousands of fishing tools that have been invented and used by the driller and well manager to meet the varied accidental emergencies daily occurring in well boring and well pumping. These tools are of all kinds, from the delicate grab designed to pick up a small piece of valve leather or a broken sucker-rod rivet from the pump chamber to the ponderous string of 'pole tools,' containing tons of iron, which at a depth of 1,500 feet or more, can unscrew a set of

'stuck tools' and bring them up piece by piece, or cut a thread upon the broken end of a sinker-bar or an auger-stem, so that it can be screwed fast to and loosened by the use of 'whiskey jacks' at the surface."

The wells first put down consisted of a four-inch hole bored wet (or with the well full of water until completed and pumped out) down to the producing sand. In this four-inch hole two-inch tubing extended to the bottom, with a seed-bag at what was thought to be the proper place. The seed-bag is a bagging of some sort placed on the tubing to fill up the space between it and the rock through which the well is bored. This contrivance is required to prevent the water in the bed-rock from flowing into the well, making it necessary to pump out water with the oil. When wells were bored wet, or full of water, it was a matter of guess-work where to place the seed-bag, and a great step forward was taken when it was found practicable to drill wells dry, for then it was possible to decide, as the well progressed, how far down it would be necessary to provide for the flow of water from the strata through which the hole was bored. A dry hole also gives notice as soon as a vein of oil is reached, the crude appearing in the sand-pump cleanings, if it is not forced up through the bore by the pressure from below. If a well starts with an eight-inch drive-pipe, that sized bore is carried down beyond the veins of water, and then gradually made to taper by using smaller drilling tools, to a five and one-half inch hole. A five and five-eighth inch casing is then put down inside the eight-inch drive pipe, and below it, until it strikes the point where the hole is reduced in size, forming at that point a tight joint with the rock and shutting off all water from above from flowing into the well. The five and one-half inch hole is continued to the producing sand, and inside of this five and one-half inch hole, a two-inch tubing is now placed, extending to the bottom of the well, terminating in what is called the "anchor," a perforated casing admitting the oil from the surrounding rock into the pipe to be pumped to the surface of the ground. There are then down to the bed-rock three pipes, one inside of the other; the outer eight-inch or drive pipe, then a five and five-eighth inch casing, and inside of the two a two-inch tubing for pumping the oil. The two latter extend to where the hole is reduced to five and one-half inches, when the outer one of the two, the casing, terminates, and the oil tubing extends alone to the bottom of the well. On this two-inch pipe, which is in the five and one-half inch hole, a water bag is placed somewhere below the point where the casing terminates; generally at the top of the oil sand, filling the hole between the rock and the pipe. It serves a double purpose, keeping above it any water that may have leaked down through the casing or come into the bore below the casing, and holding the gas from the oil stratum from reaching the surface of the ground by any other channel than the oil tube. This puts a pressure on the oil in the tube, relieving to an extent the force required for pumping, and in many cases

forcing the oil to the surface at intervals without any pumping whatever. We have described the putting down of one well. In 1889, 5,471 wells were drilled, and in 1890, 6,437. The figures will give some intimation of the magnitude of this industry.

COST OF WELLS.—We scarcely hoped to be able to secure accurate figures showing the cost of oil wells. Much of the work has always been done by contract, and the contractors are of course reticent about disclosing the actual expense. Individuals or corporations making successful ventures have often at the same time been carrying on others that have proved complete failures, and no attempt has been made to keep the results separate. The speculative features of the industry also have inevitably led to the concealment or falsification of records. Carll, in his report for 1880, gives detail figures, which, he says were furnished him by a large producer in the Bradford field, as representing the cost of a well drilled in December, 1878:—

“Carpenter’s rig complete,	\$350 00
Belt, bull-rope, engine, ‘telegraph,’ water pipes, steam pipes and fittings to connect boiler and engine,	100 00
Boiler (20 horse power) and engine (15 horse power) on ground,	750 00
Contract for drilling, contractor to furnish fuel, tools, cable, sand pump, line, etc., at 65 cents per foot, say 1,500 feet,	975 00
Casing, say 300 feet at 80 cents per foot,	240 00
Tubing, say 1,600 feet at 20 cents per foot,	320 00
Torpedo (almost universally used before tubing),	100 00
Packer,	25 00
Working barrel,	8 00
Casing head,	3 00
Tees and elbows to make tank connections,	5 00
One twenty-five barrel tank,	25 00
One two hundred and fifty barrel tank,	110 00
Tank house,	25 00
Expense of tubing and packing well,	20 00
Expense for hauling, tubing, materials, etc., say,	50 00
Total cost of well, flowing,	<u>\$3,106 00</u>

“In the above well no ‘drive pipe’ was used, a short wooden conductor set by the rig builder being all that was required. In localities where from 100 feet to 280 feet of drive pipe casing, costing \$1.80 per foot, is required, the cost of a well is increased accordingly.

“If the well is to be pumped, the following items are to be added:

Fifteen hundred feet of sucker rods at five and one-half cents,	\$82 50
Valves for working barrel,	7 00
Polished rod,	2 50
Stuffing box,	1 50
Adjuster,	5 00
Tees and elbows, etc., say,	2 00
	<u>\$100 50</u>

"The necessary tools and implements for handling the tubing and sucker rods are—

Large pully block,	\$11 00
Tubing elevators,	9 00
Three pairs of tubing tongs,	10 00
Tubing cable,	25 00
Sucker rod rope,	11 00
Sucker rod wrenches and elevators,	3 50

He also presents figures which, he says, were taken from the ledger of a company operating in the Butler field from 1862 to 1875. The costs seem to us to be very large:

<i>Year.</i>	<i>Well.</i>	<i>Depth.</i>	<i>How drilled.</i>	<i>Cost.</i>
1865, No. 1,	1,120 feet,	by day's work,	. . . . .	\$11,069 84
1866, No. 2,	1,400 feet,	by day's work,	. . . . .	11,441 94
1868, No. 3,	1,111 feet,	by day's work,	. . . . .	6,116 16
1870, No. 4,	1,262 feet,	by day's work,	. . . . .	10,405 62
1870, No. 5,	1,105 feet,	by day's work,	. . . . .	7,827 88
1871, No. 6,	1,290 feet,	drilling contract, \$3,500,	. . . . .	8,132 86
1871, No. 7,	1,414 feet,	drilling contract, 3,500,	. . . . .	8,401 41
1871, No. 8,	1,345 feet,	drilling contract, 3,600,	. . . . .	9,047 80
1871, No. 9,	1,065 feet,	everything furnished by contract,	. . . . .	5,750 00
1872, No. 10,	1,300 feet,	everything, \$6,700; extras, \$317.12,	. . . . .	7,017 12
1872, No. 11,	1,200 feet,	everything, 6,300; extras, 380.95,	. . . . .	6,680 95
1872, No. 12,	1,212 feet,	by day's work,	. . . . .	6,557 04
1872, No. 13,	1,402 feet,	by day's work,	. . . . .	6,671 06

"Nos. 9, 10 and 11 were put down by contract, the contractor in each case to furnish the rig, boiler and engine, casing, tubing and sucker-rods, and to drill the well to the oil rock and tube and test it for the price named. The extras are for drilling deeper after finding the oil sand unproductive."

For the United States Census of 1880, and again for that of 1890, careful statistics were laboriously collected at considerable expense on this and other features of the petroleum industry. We refer to these figures elsewhere at length. During the census year 1880, the Bradford district was at its height, 3,080 wells being completed in that one year. The rigs cost from \$325 to \$400, each averaging, say, \$362.50. The engines and boilers cost \$210 per well, drilling cost an average of \$1,100, pipe and tubing, \$660; torpedoes, \$300 per well, a total of \$2,632.50. In the Lower Country the average cost of 335 wells drilled during the year is put at \$2,062.50. We give the details of these figures elsewhere. For the census of 1890 the records were made for 1889. The cost would seem to have been, for rigs about \$300 per well; labor drilling, about \$500; boiler and engine about \$500; pulleys, ropes, etc., about \$75; casing and tubing about \$400, a total of about \$1,775.00.

TORPEDOES.—Henry, in his *Early and Later History of Petroleum*, outlines Colonel Roberts's discovery that the production of oil wells could be greatly increased by discharging an explosive at their bottom. Henry's work was published in 1873, and the reference to torpedoes was



A "SHOT" WELL IMMEDIATELY AFTER EXPLOSION.

reviewed and approved by the inventor himself. We, therefore, place considerable reliance on the statements which we quote:—

“In 1862, Colonel E. A. L. Roberts, then an officer in the volunteer service, and with his regiment in the Army of the Potomac in front of Fredericksburg, conceived the idea of exploding torpedoes in oil wells for the purpose of increasing the production. He made drawings of his invention, and in November, 1864, made application for letters patent. In the fall of the same year he constructed six torpedoes, and on the 2d of January, 1865, he visited Titusville to make his first experiment. Colonel Roberts's theory was received with general disfavor, and no one desired to test its practicability at the risk, it was supposed, of damaging a well. On the 21st of January, however, Colonel Roberts persuaded Captain Mills to permit him to operate on the Ladies' well on Western flats, near Titusville. Two torpedos were exploded in the well, when it commenced to flow oil and paraffine. Great excitement, of course, followed this successful experiment and brought the torpedo into general notice. The result was published in the papers of the oil region and five or six applications for patenting the same invention were immediately filed at Washington. Several suits for interference were commenced, which lasted over two years, and decisions in all cases were rendered declaring Colonel Roberts the original inventor.

“Notwithstanding the success of the first experiment, operators were still very skeptical as to the practical advantages of torpedoes, and it was not till the fall of 1865 that they would permit the inventor to operate in their wells to any extent, from fear that the explosion would fill them with rock and destroy their productiveness.

“In December, 1866, however, Col. Roberts exploded a torpedo in what was known as the ‘Wooden Well’ on the Blood farm. This well was a dry ‘hole,’ never having produced any oil. The result of the operation secured a production of twenty barrels per day, and in the following month, January, 1867, a second torpedo was exploded, which brought up the production to eighty barrels. This established for the torpedo, beyond question, all that Col. Roberts had claimed, and immediately the demand for them became great all throughout the region.”

The question of the validity of the patent was tested, and finally carried to the United States Supreme Court; where it was sustained. Justice Story, on behalf of the court, stated that “while the general idea of using torpedoes for the purpose specified is not patentable, the particular method of employing them invented by Col. Roberts is patentable; therefore he is entitled to protection.” The report of the decision from which we take the above quotation gives a description of the way in which the torpedo was used, and outlines the theory of the inventor in reference to the manner in which the flow of oil is increased:—

“The patent consists in sinking to the bottom of the well, or to that portion of it which passes through the oil-bearing rock, a water-tight flask containing gunpowder or other powerful explosive material, the flask being a little less in diameter than the diameter of the bore, to enable it to slide down easily. This torpedo or flask is so constructed that its contents may be ignited either by caps with a weight falling on them or by fulminating powder placed so that it can be exploded by a movable wire or by electricity, or by any of the known means used for exploding shells, torpedoes or cartridges under water. When the flask

has been sunk to the desired position, the well is filled with water, if not already filled, thus making a water tamping and confining the effects of the explosion to the rock in the immediate vicinity of the flask, and leaving other parts of the rock surrounding the well not materially affected. The contents of the flask are then exploded by the means above mentioned, and, as the evidence showed, with the result in most cases of increasing the flow of oil very largely. The theory of the inventor is that petroleum, or oil taken from the well is, before it is removed, contained in seams or crevices, usually in the second or third stratum of sandstone or other rock abounding in the oil regions. These seams or crevices being of different dimensions and irregularly located, a well sunk through the oil-bearing rock may not touch any of them, and thus may obtain no oil, though it may pass very near the crevices; or it may in its passage downward touch only small seams or make small apertures into the neighboring crevices containing oil; in either of which cases the seams or apertures are liable to become clogged by substances in the well or oil. The torpedo breaks through these obstructions and permits the oil to reach the well."

Prof. S. F. Peckham quotes this notice of the decision, and then states that his own conclusions in regard to the effect of the explosion are somewhat different from that outlined by Col. Roberts:—

"While not disputing that in some instances the theory of the action of torpedoes formulated by Col. Roberts may explain such action, I am forced to the conclusion that when a torpedo is exploded in such a rock as the Bradford oil-sand the crushing effect of the explosion is comparatively limited. The generation of such an enormous volume of gas in a limited area, the walls of which are already under a very high gas pressure, and which is held down by a motionless column of air of 2,000 feet (the use of water tamping has been abandoned) must be followed by an expansion into the porous rock that drives both oil and gas before it until a point of maximum tension is reached. The resistance then becomes greatest within the rock, and, reaction taking place, oil and gas are driven out of the rock and out of the well, until the expansive forces originally generated by the explosion are expended. By this reaction the pores of the rock are completely cleared of obstructions, and the pressure of the gas within the oil-rock continues to force the oil to the surface until it is no longer sufficient for that purpose."

The success of the uses of the explosives was complete from the first. Henry states that the first thirty-nine wells shocked showed an increase in production of 2,227 barrels, or an average of 57 barrels per day per well: six of the wells showing an increase of from 125 to 200 barrels each.

In these early trials gunpowder was used, being lowered to the bottom of the wells in water-tight canisters; the well being filled with water as a tamping. A weight was slipped over the wire on which the torpedo was suspended, and, sliding down the wire, struck a percussion cap at the top of the canister, exploding the charge. Nitroglycerine is now used; and the charge has been increased to enormous quantities; in some cases as much as 100 quarts are used. The large quantity is employed, in order to shock at one time a wide section of the producing



A "SHOT" WELL.—SIDE DISCHARGE.

sand; and the quantity of charge is regulated by the width of this sand. The explosive is lowered through the well bore in sections; one can of it being rested on another at the bottom of the hole, until sufficient has been put in place. A charge of 100 quarts of nitroglycerine will do the work of a ton of gunpowder. A cap is adjusted to the top of the last section; and, upon it, a weight is dropped down through the well, after the cord lowering the nitroglycerine has been withdrawn. A few seconds after the explosion a fountain of oil, water, mud and pebbles shoots up through the well-mouth to the top of the derrick and above it; saturating it with oil, and scattering a shower of broken stones in every direction.

In Taylor's *Handbook of Petroleum* for 1884, a most graphic description of one of these explosions and of the results following is given. The increase in production of oil in this particular case was unusual, perhaps the largest on record:—

“October 27, 1884, those who stood at the brick school-house and telegraph offices in the Thorn Creek district to-day and saw the Semple, Boyd and Armstrong No. 2 torpedoed, gazed upon the grandest scene ever witnessed in oildom. When the shot took effect, and the barren rock, as if smitten by the rod of Moses, poured forth its torrent of oil, it was such a magnificent and awful spectacle that no painter's brush or poet's pen could do it justice. Men familiar with the wonderful sights of the oil country were struck dumb with astonishment, as they gazed upon the mighty display of Nature's forces. There was no sudden reaction after the torpedo was exploded. A column of water rose eight or ten feet and then fell back again, and some time elapsed before the force of the explosion emptied the hole and the burnt glycerine, mud and sand rushed up in the derrick in a black stream; the blackness gradually changed to yellow; then, with a mighty roar, the gas burst forth with a deafening noise; it was like the thunderbolt set free. For a moment the cloud of gas hid the derrick from sight, and then, as this cleared away, a solid golden column half a foot in diameter shot from the derrick floor eighty feet through the air, till it broke in fragments on the crown pulley, and fell in a shower of yellow rain for rods around. For over an hour that grand column of oil, rushing swifter than any torrent, and straight as a mountain pine, united derrick, floor and top. In a few moments the ground around the derrick was covered several inches deep with petroleum. The branches of the oak trees were like huge yellow plumes, and a stream as large as a man's body ran down the hill to the road, where it filled the space beneath the small bridge at that place, and, continuing down the hill through the woods beyond, spread out upon the flats where the Johnson well is. In two hours these flats were covered with a flood of oil. The hill-side was as if a yellow freshet had passed over it; heavy clouds of gas, almost obscuring the derrick, hung low in the woods, and still that mighty rush of oil continued. Some of those who witnessed it estimated the well to be flowing 500 barrels per hour. Dams were built across the stream, that its production might be estimated; the dams overflowed and were swept away before they could be completed. People living along Thorn Creek packed up their household goods and fled to the hill-sides. The pump station, a mile and a half down the creek, had to extinguish its fires that night

on account of the gas, and all fires around the district were put out. It was literally a flood of oil. It was estimated that the production was 10,000 barrels the first twenty-four hours. The foreman endeavoring to get the tools into the well was overcome by the gas and fell under the bull wheels; he was rescued immediately and medical aid summoned; he remained unconscious for two hours, but subsequently recovered fully. Several men volunteered to undertake the job of shutting in the largest well ever struck in the oil region. The packer for the oil-saver was tied on the bull wheel shaft, the tools placed over the hole and run in. But the pressure of the solid stream of oil against it prevented its going lower, even with the suspended weight of the two-thousand-pound tools; one thousand pounds additional weight was added before the cap was fitted and the well closed. A casing connection and tubing lines connected the well with a tank."

FLOODING. —Assuming that the oil-charged rocks lie in beds surrounded by harder impervious formations, so that each bed forms practically an independent reservoir saturated with oil and gas under great pressure, the pressure supposed at times to be as much as 300 pounds to the square inch; it will be clear that, as an outlet is given for the oil and gas, the pressure must be gradually reduced. There is good proof of this in the fact that the wells first drilled into a pool or section of oil-bearing rock yield best, even though they be only on the outskirts of the deposit; and wells put down later into the center of the bed do not yield so much, and always reduce the yield of the first wells. So long as the pressure continues, all the force is exerted outward and upward from the rock below, extending back from the sand immediately surrounding the bore further and further as the pressure is gradually relieved by the escape of the oil and gas up through the well. By natural law an equilibrium is being established. It finally is established when the well ceases to flow. If it is now pumped, a partial vacuum is formed. It is then that flooding, or filling of the oil rock with water to replace the oil and gas that have been sucked out of it, can occur. Producers try to guard against this. It is the practice, when wells have ceased to yield oil in remunerative quantities, to draw the iron casing out of them for use in other wells. Through carelessness, these abandoned wells are sometimes left unplugged; that is, the hole is left open instead of being filled with earth. Surface water is thus allowed to run down to the oil-bearing strata, and spread itself indefinitely until it reaches other wells in the same strata, and they begin to pump oil and water mixed and perhaps water only. This is so important a matter to the general welfare of the oil-producing region that a law has been enacted making it a misdemeanor for an owner to abandon a well and leave it unplugged. The penalty is \$200 for each offense; one-half to go to the informer, and one-half to be turned into the fund for the use of schools in the district where the well is situated. The enactments are those of May 16, 1878, and June 10, 1881, quoted below:—

“Oil-wells to be plugged.

16 May, 1878, Sec. 1 (P. L. 56.)

All owners of and operators of oil lands within this commonwealth, shall in a practical manner plug their wells, at proper depth, with wood and sediment, in a manner sufficient to exclude all fresh water from the oil-bearing rock, and to prevent the flow of oil or gas into the fresh water.

“Penalty for omission. Ibid. Sec. 2.

Any person found guilty of violating the provisions of this act shall be fined in any sum not less than twenty nor more than one hundred dollars for each and every offense; which shall be paid, one-half to the informer and the other half to the school district in which the offense is committed, which shall be collected as fines of like manner are by law collected.

“Powers of adjoining owners in case of neglect. Ibid. Sec. 3.

Whenever the owner of any well has abandoned the same or does not reside in the county in which it is situated, any person owning property adjoining may enter in and take possession of any well, for the purpose of carrying out the provisions of the first section of this act, where the owner has refused or neglected to plug said well, so as to shut off the fresh water from the oil rock and exclude the gas and oil from the fresh water, as provided in section first, at the expense of the owner.

“How abandoned wells to be plugged.

10 June, 1881, Sec. 1 (P. L. 110.)

Whenever any well shall have been put down for the purpose of exploring for any producing oil, upon abandoning or ceasing to operate the same, the owner or operator shall, for the purpose of excluding all fresh water from the oil-bearing rock, and before drawing the casing, fill up the well with sand or rock sediment to the depth of at least twenty feet above the third sand or oil bearing rock, and drive a round, seasoned, wooden plug at least two feet in length, equal in diameter to the diameter of the well below the casing, to a point at least five feet below the bottom of the casing, and immediately after the drawing of the casing, shall drive a round wooden plug into the well, at the point just below where the lower end of the casing shall have rested, which plug shall be at least three feet in length, tapering in form, and to be of the same diameter at the distance of eighteen inches from the smaller end, as the diameter of the well below the point at which it is to be driven; (and) after it has been properly driven, shall fill in on top of same with sand or rock sediment, to the depth of at least five feet.

“Penalty for neglect. Ibid. Sec. 2.

Any person who shall violate the provisions of the act shall be liable to a penalty of two hundred dollars, one-half to be for the use of the informer, and one-half to the use of the school district in which such well may be situated, to be recovered as debts of like amount are by law recoverable.

“Powers of adjoining owners. Ibid. Sec. 3.

Whenever any owner or operator shall neglect or refuse to comply with the provisions of (this) section one of this act, the owner of, or operator upon any land adjoining that upon which such abandoned well may be, may enter, and take possession of said abandoned well, and

plug the same as provided by this act, at the expense of the owner or operator whose duty it may be to plug the same."

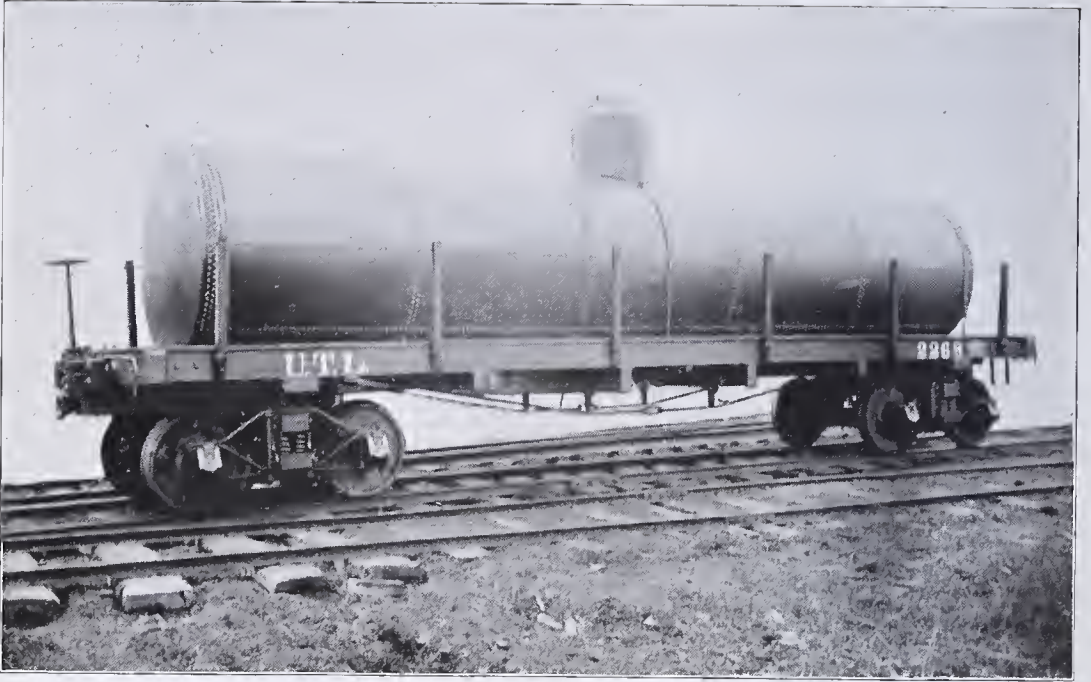
J. F. Carll reviews this general subject of flooding, at greater length than we have space to do. We quote two extracts from his report:—

"In judging of the probable effects of the introduction of water into any particular oil district several things are to be considered.

"(1). The time of flooding, whether early in the progress of the development, while yet a large percentage of oil remains unexhausted, or at a later period after the supply has suffered from long continued depletion. (2) The structure of the rock, whether regular and homogeneous throughout, or composed of fine sand interbedding connected and irregular layers of gravel, sometimes lying near the top and at others near the bottom. (3) The shape of the area being flooded. (4) The position of the point at which water is admitted, in relation to the location of the surrounding wells still pumping oil. (5) The height (which governs the pressure) of the column of water obtaining admittance. (6) The duration of the water supply. It will readily be seen that a temporary flooding in comparatively fresh territory, such as frequently occurred in early days along Oil creek from the drilling of new wells without casing or the overhauling of old ones, where the seed bag was attached to the tubing in a primitive way, must necessarily be quite a different affair from one caused by a permanent deluge through unplugged and abandoned wells in nearly exhausted territory.

"In the former case the flood may be checked before much water has accumulated in the rock, and then the oil flow can be reclaimed after a few days of persistent pumping; in the latter the recovery of the oil is very uncertain, because from its long continued extraction a greater capacity has been given to the rocks for storing water, and this being supplied from scattered and obscure sources, there is little probability that it can be shut off, although most thorough and systematic attempts may be made to check it. * * * * *

"The first intimation of the flooding of a district is given by an increased production from the wells affected by it. Old wells, without any observable cause, improve gradually, running up from five barrels per day to ten or twenty, or even fifty. After pumping in this way for some time the oil quickly fails and they yield only a few barrels of salt or brackish water. As the wave moves on, the wells in advance, one after another, are affected in the same way. In some districts the movement is quite rapid and wells are invaded and 'watered out' in quick succession; in others it is so slow that large quantities of oil are obtained from those which are favorably located to receive a 'benefit.' Flooding a well is sometimes a very profitable way of closing up its career, inasmuch as it thus yields more in a few months than it otherwise would in years, and when the water reaches it, the owner knows at once what it betokens and stops work, thus saving the time and money usually expended in fruitless efforts to reclaim a well failing through natural decline."



AN OIL TANK CAR.



WAGON FOR RETAILING OIL.

TRANSPORTATION OF CRUDE PETROLEUM.

Early Methods.—Pipe Lines.—Pipe Line Pumps.—Pipe Line Tanks.—Cleaning Pipe Lines.—Loading Racks.—Pipe Line Companies.—Pipe Line Certificates.

EARLY METHODS.—One of the first great problems which the oil producer had to solve was that of transportation. The market for his product was the refineries that had been constructed in some of the large cities, particularly at the seaboard, for the production of illuminating oil out of coal. The oil wells along Oil creek and the Allegheny river were at first many miles from a railroad, in a lumber district where there were often no roads or at best very poor ones. Those who have travelled in the oil region know that for several months of the year the roads are rendered almost impassable by the mud. Their condition in the days when they were merely trails up over the hills and through the valleys of the sparsely-settled country can be hardly imagined.

Oil City was the nearest shipping point; and Pittsburg, the large distributing center. Crude oil was put into barrels, loaded on trucks and hauled to Oil City. The loss was very great. The barrels, being old, leaked freely as they made their rough trip from the interior to the railroad. Barges were soon called into use and the barrelled oil loaded on them; or the barges themselves were made tank boats for holding the oil in bulk, and the load floated down Oil creek to the Allegheny river at Oil City. But Oil creek during most of the year was a shallow stream; and the novel plan of slack water navigation, known as a pond freshet or "pond fresh," was resorted to. The water in the streams tributary to Oil creek was held back by dams, until sufficient quantities had accumulated; and then, at a fixed hour, each body of water was in turn released, filling the main stream for a short time with a flood. On this the barges of oil were carried down to their destination, warning having been given so that the boatmen along the stream might be ready to take advantage of the tide as it passed. The body of water was not large in extent; and considerable skill had to be used in starting at the right moment, and in navigating the boat during the trip. If the start was made too late, the waters would pass ahead and leave the craft stranded. If it was made too soon, the barge might be caught in the boiling waters and the power to guide it lost. Henry, in his *Early and Later History of Petroleum*, speaks of this mode of transportation as follows:—

"Arrangements were made with the mill-owners at the head of Oil creek for the use of their surplus water at stated intervals. The boats were towed up the creek by horses, not by a tow-path, but through the stream, to the various points of loading, and when laden they were floated off on a pond freshet. As many as 40,000 barrels were brought out by the creek on one of these freshets, but the average was between

15,000 and 20,000. At Oil City the oil was transferred to larger boats. At one time over 1,000 boats, thirty steamers, and about 4,000 men were engaged in this traffic. At times, great loss occurred from collisions and jams. During the freshet of May, 1864, a 'jam' occurred at Oil City resulting in the loss of 20,000 to 30,000 barrels."

Losses were frequent. The barges collided with each other, or struck projecting rocks in their rapid trip. Therefore, when boats were introduced for carrying the oil from Oil City down the Allegheny to Pittsburgh, larger and stronger ones were constructed.

In the meantime, in 1862, the Atlantic and Great Western railroad was carried into the oil region. In 1866, the Allegheny Valley railroad was opened up from Oil City, at the mouth of Oil creek, to Pittsburgh; and a number of narrow gauge lines constructed as feeders into the heart of the producing country. At first the barrels were loaded on flat cars, but the water mixed with the oil dissolved the glue used for coating the inside of the barrels, and the leakage in consequence was so large that wooden tank cars were soon built with two wooden tubs or vats, each holding 2,000 gallons, placed on an ordinary platform car. This was the forerunner of the tank car of to-day. In 1872, cars consisting of a horizontal cylindrical tank of iron mounted on a four-wheel platform or railroad-truck, appeared. These were at first of no greater capacity than the wooden cars they displaced; but have been gradually increased in size as their plan of construction has been improved, until many of them are now of 8,000 gallons capacity each. Of these we will speak at length in our chapter on the domestic trade in oil products.

PIPE LINES.—The magnitude of the petroleum industry made it necessary to find some mode of transportation even cheaper than a railroad. By force of circumstances, barges and tank cars for oil in bulk displaced the truck carrying oil in barrels. The pipe line, in turn, displaced the car and boat. The introduction of this mode of transporting oil marks an era in the petroleum industry. The freight by rail amounted to five or six dollars per car from the region to New York. It was most economical, therefore, to refine the crude near the wells; so that freight need be paid only on the products desired, and the quantity to be moved reduced to a minimum. The country around Pittsburgh and Oil City was filled with little works taking out of the crude the refined oil needed for export. When the idea of allowing the oil to flow from place to place through iron pipes was put into practical form, the cost of transportation was so much reduced that a few enormous refineries were built at the seaboard near New York, Philadelphia and Baltimore; and, on the shores of Lake Erie, near Buffalo and Cleveland, to do the work which the almost countless small refineries in the oil region had heretofore done. This meant a revolution in methods of manufacture and in costs. Careful search has been made in the existing literature on petroleum to

find the first reference to the use of a pipe line for the transportation of oil. The account given by C. L. Wheeler, quoted by Peckham from the *Bradford Era*, probably deserves this distinction:—

“He said, in substance, that the first suggestion of a pipe line for transporting oil, so far as he knew, was made to him by General S. D. Karns at Parkersburg, West Virginia, in November, 1860. Mr. Karns said that as soon as he could raise the money, he would lay a six-inch gas pipe from Burning Springs to Parkersburg and let the oil gravitate to the Ohio river, a distance of thirty-six miles. For some reason, this line was never laid. Some years after, Mr. Wheeler was unable to recall the exact date, a Mr. Hutchinson, inventor of the rotary pump which bears his name, conceived the idea of forcing oil through pipes, and explained his plan to John Dalzell and the narrator in the latter's office in Titusville. Subsequently Hutchinson's plans became a reality, the first pipe-line being laid from the Sherman well to the terminus of the railroad at Miller farm, a distance of about three miles. The inventor's idea of the hydraulic pressure of a column of that length was certainly very exalted, and he took elaborate pains to prevent the breaking of pipes. At intervals of fifty or one hundred feet were air chambers like those on pumps, ten inches in diameter, for the purpose of equalizing the pressure. These queer protuberances gave the line the appearance of a fence with ornamental posts, and excited great curiosity. The weak point, however, was the jointing, which, as the pipes were of cast-iron and imperfectly finished at their ends, was very defective, and the leakage from this cause was so great that little, if any, oil ever reached the end of the line. It was a success theoretically but a mechanical failure. Thus the expectations for easy and cheap transportation for crude oil raised by the building of the first pipe line were ruthlessly dashed to the ground and the inventor discontinued his experiments in despair.”

In 1862, we believe, a bill was introduced into our State Legislature to authorize the construction of a pipe line from Oil creek to Kittanning; but, owing to the vigorous opposition of those interested in teaming oil, it was not passed. Later a plan to lay a line down the Allegheny river to Pittsburg, for the same reason came to nothing.

Samuel Van Syckle, of Titusville, was the first to put down a working line. It was only four miles long, extending from Pithole to Miller's farm, and carried but eighty barrels per day. It demonstrated, however, the thorough practicability of moving oil in this way. The difficulty up to this time had been in making the joints of the pipe tight. Van Syckle overcame this; and, although his line faced an ascent of nearly five hundred feet, the oil was delivered at the further end practically without loss. This line, together with another laid in the same year by Henry Harley from Benninghoff run to Shafer farm, passed into the control of a corporation known as the Allegheny Transportation Company, by which it was operated.

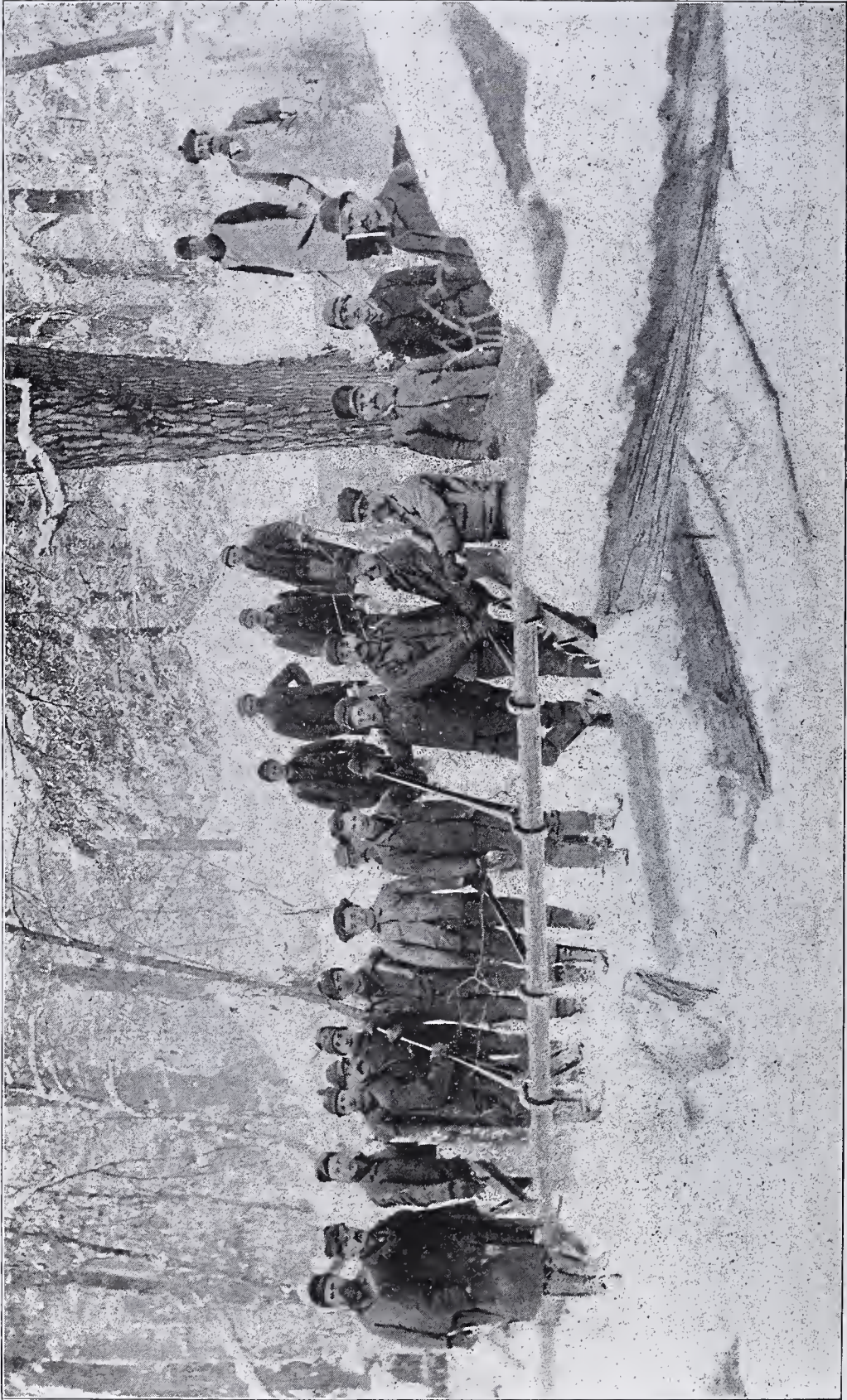
The owners and drivers of oil wagons saw that this mode of transportation must soon deprive them of occupation and they did what they could to retard the progress of the work. They cut the lines, set fire to the tanks with which they were connected, and even threatened the proprie-

tors and managers with personal violence. An armed patrol and the arrest of the ringleaders by detectives soon quelled this outbreak. The pipeage of oil was a great general improvement, and personal interest had to yield. To-day the oil region is a network of pipes; and great trunk lines, pulsing with the moving oil, supply the needs of New York Philadelphia, Baltimore, Cleveland, Buffalo, Pittsburg, Chicago and of many intermediate points.

The growth, however, was gradual. Lines were first laid only to the refineries in the oil region, and to the railroads taking the oil out of the region. With the lengthening of the pipes and the increase of pressure to force the liquid to greater distances, men became more and more impressed with the possibilities of the new mode of transportation, and enthusiastic ones began to believe there was no point short of the seaboard to which the oil might not be sent. In 1875, an organization called the Pennsylvania Transportation Company was granted a charter with power to construct a pipe line to the seaboard. The only outcome of this venture was the building of various lines within the oil region. Short lines multiplied, and pipe after pipe from the producing fields to the refineries and railroad shipping points crossed and paralleled one another in every direction. Competing companies waged war upon one another, cutting rates to the point of doing business at an actual loss. When the producer had run his oil into the storage tanks of some of these concerns, he was not certain whether the certificate received (for they all issued certificates instead of paying cash for oil) had any value; yet he must either send the oil through the pipe nearest to him, or allow it to pass back into the earth from which it came. The concentration of these badly-managed competitive companies into some centralized organization with systematic and economical methods was a necessary consequence of the situation.

The United Pipe Lines' Association, first known as the Fairview Pipe Line, organized by Captain J. J. Vandergriff and George V. Forman, became the starting point for such a movement. This association was incorporated under the general act of April 29, 1874. Into it were merged from time to time the other local lines; the Antwerp, Oil City, Clarion, Union, Conduit, Karns, Grant, Pennsylvania, Relief, the Clarion and McKean divisions of the American Transfer Company, the Prentiss lines, the Olean pipe, the Union Oil Company's line at Clarendon, the McCalmont line, with others too numerous to mention.

The first trunk line was laid in 1875 from the lower oil country to Pittsburg. It consisted of 39 miles of four inch pipe running from Carbon Center in Butler county to Brilliant, a suburb of Pittsburg. The trunk line to Cleveland next followed; consisting of a six-inch line from Bear Creek to Hilliards, the first pumping station, and from there a five-inch line to Cleveland. The total length is about 111 miles. The trunk line to Philadelphia starts at Colegrove in McKean county, and extends



LAYING PIPE LINE.

about 235 miles to Philadelphia, six-inch pipe all the way. From Millway, the last pumping station before reaching Philadelphia, a five-inch branch runs down to Baltimore, a distance of about 66 miles. The Buffalo line is about 56 miles long, having its initial point at Olean, N. Y. It is four-inch pipe. The New York line consists of two six-inch pipes starting at Olean, N. Y., and running parallel to each other through the southern counties of New York State, to Saddle River, N. J., where the lines separate; one going down to the refineries at Bayonne, N. J., and the other going under the North and East rivers to the refineries at Hunter's Point, on Long Island. In addition to the two parallel six-inch lines, the New York line is looped at many of the stations; that is, extra lines are put in to relieve the pressure on the other lines and so increase somewhat their capacity: thus making the total length of pipe used 762 miles, the distance traversed by the line being 313 miles.

The Tide Water line of six inch pipe, extends from Rixford in McKean county to the refinery of the Tide Water Oil Company, Limited, at Bayonne, N. J., a distance of 284 miles.

The Southern Trunk line starts from Morgantown, W. Va., and extends to Philadelphia; a distance of 274 miles. This line is composed of six-inch and eight-inch pipe, the total length of pipe being about 364 miles.

We give below a table showing the actual length of each trunk line. In addition to this there are many other large lines connecting the various systems and different oil fields.

For example: Between Kane and Bear creek, a distance of 63 miles, there are five six inch lines; from Kane to Colgrove, there are 22 miles of eight inch pipe; from Colegrove to Olean, 30 miles of eight inch pipe. The total pipe, including these large connecting lines and the double lines and loops, amounts to 3,000 miles.

PITTSBURG LINE, four-inch pipe.	<i>Miles.</i>
Bear Creek to Pittsburgh,	55
BUFFALO LINE, four-inch pipe.	
Olean to Buffalo,	56.25
CLEVELAND LINE, five-inch pipe.	<i>Miles.</i>
Bear Creek to Simpson,	29.81
Simpson to Warren,	30.23
Warren to Mantua,	22.16
Mantua to Cleveland,	28.59
	<hr/>
	110.79
PHILADELPHIA LINE, six-inch pipe.	<i>Miles</i>
Colegrove to Hunt's Run,	23.41
Hunt's Run to North Point,	25.90
North Point to Pine,	25.73
Pine to Latshaw,	45.40

Latshaw to Millway,	51.94	
Millway to Philadelphia,	62.50	
		234.88
BALTIMORE LINE, five-inch pipe.		
Millway to Baltimore,		65.80
NEW YORK LINE, six-inch pipe.	<i>Miles.</i>	
Olean to Wellsville,	28.54	
Wellsville to Cameron Mills,	27.91	
Cameron Mills to West Junction,	29.74	
West Junction to Catatunk,	27.37	
Catatunk to Osborne Hollow,	27.99	
Osborne Hollow to Hancock,	29.86	
Hancock to Cochection,	26.22	
Cochection to Swartwont,	28.94	
Swartwont to Newfoundland,	29.00	
Newfoundland to Saddle River,	28.77	
Saddle River to Bayonne, N. J.,	16.29	
Saddle River to Hunter's Point, N. Y.,	12.26	
Total (with loopings),		762.01
TIDE WATER LINE, six-inch pipe.	<i>Miles.</i>	
Rixford to Olmstead,	28.7	
Olmstead to County Line,	36.0	
County Line to Muncy,	53.5	
Muncy to Shuman,	33.9	
Shuman to Hudsonsdale,	27.65	
Hodsonsdale to Changewater,	52.5	
Changewater to Bayonne, N. J.,	51.5	
Total,		283.75
SOUTHERN LINE, eight-inch and six-inch pipe.	<i>Miles.</i>	
Morgantown to Watson,	33.88	
Watson to State Line,	35.82	
State Line to Knepper,	66.67	
Knepper to Millway,	75.42	
Millway to Philadelphia,	62.50	
Total (with loopings),		364.29
CRESCENT PIPE LINE (MELLON LINE), five-inch pipe.	<i>Miles.</i>	
Greggs to Milbank,	about 48	
Milbank to Ingleside,	" 24	
Ingleside to Saxton,	" 30	
Saxton to Mount Holly,	" 55	

Mount Holly to Florinal,	about 40	
Florinal to Linwood,	" 60	
<hr/>		
Total,		267
UNITED STATES PIPE LINE (EMERY LINE), double line, four-		
inch and five-inch pipe.		<i>Miles.</i>
Titusville to Tarport,	about 65	
Tarport to Westfield,	" 60	
Westfield to Athens,	" 55	
<hr/>		
Total (two lines),		360

The trunk lines carrying Pennsylvania crude are nearly 3,000 miles in length; but this does not include the network of two-inch pipes that fairly cover the producing country, and serve as feeders for the trunk lines. A representative of the Standard Oil Company appearing before a committee of the State Legislature, in February, 1891, testified that the total length of lines transporting Pennsylvania crude was undoubtedly 25,000 miles; or, as one of the senators put it, "a girdle for the earth."

The lines are usually laid under ground with bends, at intervals, to allow for expansion and contraction. The pipe for these trunk lines is made especially for them. It is wrought iron, lap welded, and comes in lengths of 18 feet. On each end coarse and sharp taper threads are cut, nine to the inch, and the lengths are connected with long sleeve couplings, also screwed taper. The pipe is tested to stand a pressure of 2,000 pounds to the square inch, made necessary by the tremendous pressure carried on some of the pumps. This is sometimes as high as 1,500 pounds. It can be appreciated by remembering that, in addition to overcoming the friction of the oil on the line, which increases enormously as the rapidity of the flow is increased, the large body of liquid is made to move with great speed. It was found that the friction on the 108 miles of six-inch pipe between Rixford and Williamsport, Pa., was equal to a column of oil 700 feet high—that is, had this line had a gradual descent amounting to 700 feet, the adhesion between the oil and pipe would have prevented any flow, with the pipe full of oil for the 108 miles.

At each station there are two or more storage tanks of from 30,000 to 35,000 barrels capacity, the oil being received from the station next before into one of the tanks, while the pump is emptying another. In this way the movement of oil through the trunk lines is made incessant. Most of the stations are also provided with duplicate pumping machinery so that there need be no interruption of the flow of oil even when one pump has to be stopped for repairs. The distance between stations averages 28 to 30 miles, but loops are sometimes laid around a station so that one pump has moved oil as far as 110 miles.

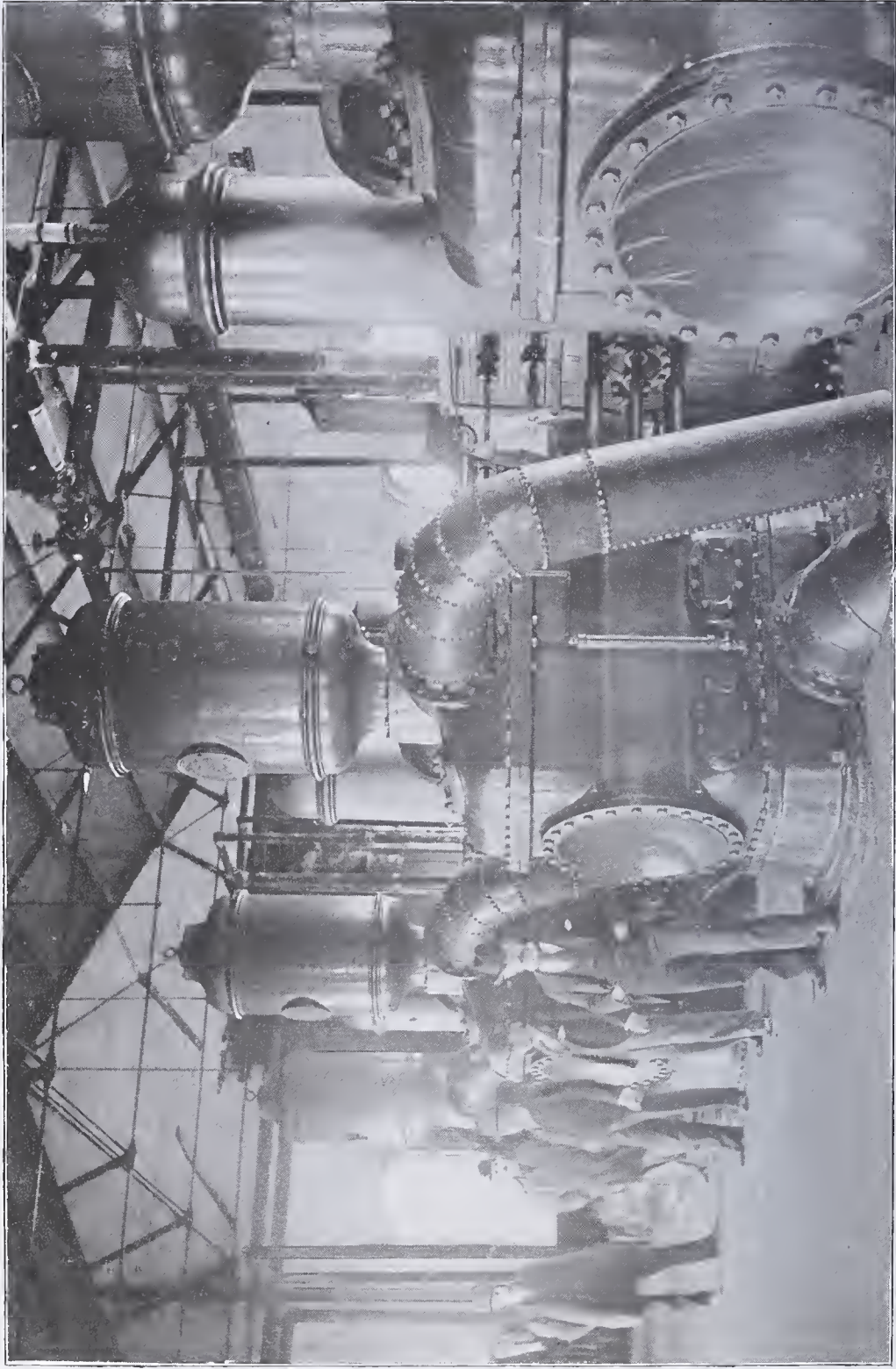
Where the New York trunk line passes under the Hudson river it is double—that is, one pipe is placed inside of another with tight fitting sleeve joints. The jacket pipe has its ends separated by a space of 12 inches to permit the enclosed pipe to be screwed home. The sleeve is then pushed over the 12-inch gap, and the whole space between the pipes is filled with lead poured in melted. The line is held in place on the bottom of the river by two sets of heavy chains parallel with the pipe and about twenty-five feet from it, one on each side. Every 300 feet a guide chain connects the pipe with these lateral chains, and beyond each one of these connections an anchor, weighing over a ton, keeps the whole in place. The line crossing the salt marshes approaching the river is laid in a rectangular wooden box, filled with hydraulic cement to withstand corrosion.

PIPE LINE PUMPS.—The pumps employed for this severe service are magnificent machines. Most of them have been built by the Worthington Company. They have been described by the *Engineering News* and the *Scientific American* somewhat as follows:—

Each pump has four steam cylinders—two high and two low pressure—steam jacketed, each set working tandem, direct acting. Each pair of cylinders actuates two single stroke rams of the exterior packed type. The engineer thus has the only possible source of plunger leakage always before him. The steam, going from the high to the low pressure cylinder, passes through a receiver, where it is heated. The valve boxes are subdivided into small chambers, with leather-lined metallic valves with low lift and large surfaces. The general dimensions are:

Diameter of low pressure steam cylinder,	66"
Diameter of high pressure steam cylinder,	33'
Diameter of plungers,	9 ¹ / ₄ "
Stroke,	37 ³ / ₄ "
Horse power, 440.	
Average duty, 105,000,000 foot pounds per 100 pounds of coal.	
Rated capacity, 1,500,000 gallons against a pressure equal to 2,000 feet head of water.	

The disproportion of diameter between the steam pistons and pump plungers shows the nature of the service the pumps are designed to perform. To maintain an even pressure on the line a pair of compensating cylinders and plungers at the outer end of the rams take the place of the usual air chamber or fly wheel. These are two vertical cylinders, each mounted on trunions near its center. "A heavy pressure is maintained by the accumulator and fluid on the rear of the plungers, tending to thrust them out. As the rams of the main pump move outward from the center position the compensating cylinders swing on their trunions and take increasingly oblique positions as the pump gets nearer the end of its stroke. The compensating rams are forced out during this period and re-enforce the action of the steam, whose pressure is getting lower owing to expansion. On the return stroke the compensating rams are pushed back against the accumulator pressure, their cylinders swinging back to the perpendicular position. In this period, therefore, the action of the steam at a high pressure in the steam



PUMPS.

cylinder is resisted by the rams. As the stroke returns from the center in the other direction the compensating rams act as in the other half stroke. By thus opposing the action of the unexpanded and resisting the action of the expanded steam, an almost even action is preserved at all periods of the stroke, and a nearly constant pressure is exerted on the liquid pumped." By this means the column of oil is kept continually in motion without any violent concussion on the line, as is generally the case with a direct-acting pump. During the last few years the National Transit Company have been building their own pumps, constructing for trunk line service enormous triple expansion crank and fly wheel engines, which are superseding other makes of pumps on their lines. At each station there is generally one of these high-duty engines and a low-duty one for relief or emergency service. Most of the pumping is done by the machine just described, the other being employed when the main pump is being repaired or adjusted.

A station equipped with a high-service pump has also seven or eight horizontal tubular boilers, 80 to 100 horse power each. Six of the boilers are fired at once. They are placed in a boiler-house 40 feet square, built of brick and covered with a corrugated iron roof. The pumps are in a separate brick building, being separated for greater safety from fire. The stations are lighted by electricity, as the pump never stops moving the oil forward every day and night in the year. The stations are connected with one another and with the main offices of the pipe lines by independent telegraph wires. When a producer's tank is measured and accepted by a gauger and the oil passed into the pipe line, a report is telegraphed to the central station of that section of the field. A complete record of the capacity of each tank in the field is here kept by which the feet and inches of the oil indicated by the despatch, are at once converted into barrels and placed to the credit of the producer on the books of the pipe line. By this means, at the end of each day, an accurate return can be made of the oil received; which, checked by an equally accurate report of the oil delivered, enables the pipe line to know their stocks at all times.

At each station there are two or more receiving or storage tanks built of light boiler iron; the usual size being about 90 feet in diameter, and 30 feet high. These tanks have conical roofs of wood covered with No. 20 iron. Each tank holds about 30,000 barrels of oil. A general idea of the plan of construction of storage tanks can be learned from the following specifications under which the tanks of many of the pipe lines are built:

CLEANING PIPE LINES.—All crude petroleum contains more or less amorphous or uncrystallized paraffine or wax. Water mixed with crude oil forms an emulsion or soapy deposit. The paraffine is known in the oil region as "sucker-rod wax," because it collects on the rods used for pumping wells. The emulsion is locally known as "B. S." These two sediments, together with the impurities naturally incident to the mining of petroleum and its transfer from point to point, gradually choke the pipe lines, particularly in colder weather. To clean them, a curious instrument called a "go-devil" is sent through the pipe. These scrapers or brushes have at different times been of various designs, the one now used being the improved instrument that experience has shown is best suited to the work. It is a spindle with a ball and socket joint near its center so that it can follow the bends in the pipe. This spindle is fitted with steel blades set radially. It is kept in position in the pipe by three arms both in front and rear, with a guide wheel on the end of each arm. Oblique vanes put in motion by the moving oil rotate the spindle and the steel blades scrape the pipe. At the rear end of the "go-devil" a piston that approximately fits the pipe, gives the instrument a forward motion, being impelled by the oil pumped through the line. Until within a few years, it was customary for men to follow the scraper in its trip, knowing where it was by the whirring noise it made; any obstacle being located by the stopping of the "go-devil." This is no longer thought necessary. A catch-box is placed at the other end of the line and the time of the trip is so well known that the arrival of the little traveler can be quite closely timed. But the lines are regularly patrolled to promptly detect any leaks, although the system of checking from tank to tank makes it impossible for any serious break to occur without detection.

LOADING RACKS.—Closely associated with the pipe lines in such a description as this should be the loading racks for filling tank cars on railroad sidings. There are very many of these, both in the oil region and at different points along the main trunk lines, and at their termini. From one car to an entire train of thirty to forty cars can be loaded at once at many of these racks. The construction is of the simplest character; and, in general, the same at all points. Perpendicular branches are carried up at intervals, equal to the length of a tank car, from the main oil line, which is run along the side of the track. These branches are each provided with a stopcock and a movable pipe of proper length to reach over into the dome of the tank car standing on the track; when moved into that position by a man passing from one of these upright branches to another, on a platform that has been erected at a convenient height. When the train of cars has been pushed into place on the track, these movable pipes are put over the platform down into the domes of the cars and the oil turned on. As many cars as the side track will hold can thus be loaded at the same time.

PIPE LINE COMPANIES.—The trunk lines are controlled by the National Transit Company; the Tide-Water Pipe Company, Limited; the Octave Pipe Line; the Southwestern Pennsylvania Pipe Lines; the Eureka Pipe Line Company; the Buckeye Pipe Line Company; the Southern Pipe Line Company; the Charles Miller Pipe Line; the Western and Atlantic Pipe Line; the Elk Pipe Line; the Crescent Pipe Line (Mellon Line); the Producers' Pipe Line; the Producers and Refiners' Oil Company, Limited; the United States Pipe Line (Emery Line), and the New York Transit Company. The first two mentioned are the most important. These companies move the oil from the region to the terminus of their lines. The National Transit Company does a very large proportion of the entire business. We believe it holds the original charter granted to Andrew Howard, and J. S. Swartz and others under the name of the Pennsylvania Company, by the Act of April 7, 1870. In 1880, it absorbed the business and plant of the American Transfer Company; and, on April 1, 1884, the business and plant of the United Pipe Lines—that branch of the organization being since known as the United Pipe Lines Division of the National Transit Company.

PIPE LINE CERTIFICATES.—The National Transit Company and the Tide-Water Pipe Company, Limited, are the only lines issuing certificates for crude petroleum received. These are printed acceptances for crude, and are negotiable the same as a certified check. We give below copy of a certificate of the National Transit Company.

Acceptance

No. OIL CITY, Pa., 18 . .

NATIONAL TRANSIT COMPANY, (1,000)

Through its UNITED PIPE LINES division,

Deliver to or order,

ONE THOUSAND barrels of crude petroleum (of 42 gallons each) on the following terms, which are agreed to by the holder hereof:

1. It is agreed that the petroleum mentioned in this order is held by the National Transit Company, subject to a transportation charge of twenty cents per barrel, and a storage charge which will be at the rate of twenty-five cents per day per thousand barrels, as long as the market price of certificate oil is below one dollar per barrel; thirty-five cents per day when the market price is from one dollar to one dollar and fifty cents per barrel, and forty cents per day when the market price is above one dollar and fifty cents per barrel; no change, however, to be made in rate of storage on account of prices going above or below the prices named, unless the market price remains above or below the specified point for thirty consecutive days, and that the point of delivery of such oil shall be within the United Pipe Lines Division.

2. It is further agreed that this order shall be returned to the National Transit Company for exchange within six months from date of issue, or be subject to a storage charge of one twentieth (1-20) of one cent per barrel daily thereafter until returned.

3. It is further agreed that the National Transit Company shall not, in any event, be liable for any loss of crude petroleum resulting from lightning, fire, storms or any other unavoidable causes, it being distinctly understood and agreed that any such loss or losses shall be charged pro rata upon all petroleum in its custody at the time of such loss or destruction, and that the quantity of petroleum called for by this order shall be reduced by its proportion of such loss or destruction.

4. It is further agreed that transportation and all accrued storage charges shall be paid on the amount so deducted.

Order Accepted.

No Agent. Registrar.

The system of issuing these certificates is, briefly, as follows;

When a producer wishes to deliver oil from his tank, he notifies a representative of the pipe line, who measures the oil and gives a voucher for it, running it into the line. The oil thus received is treated the same as a deposit in a bank. Against it certificates are issued in lots of one thousand barrels each, at the request of the owner. It is in these that the Oil Exchanges deal. It is needless to take space to de-

Not good until accepted
by
Agent at

scribe these exchanges located at New York, Oil City, Bradford, Pittsburgh, Philadelphia, Titusville, and elsewhere; nor the speculation in oil certificates. The largest number of clearances reported for any one year, is that for 1886, footing up 4,593,379,000 barrels. This speculative feature of the industry has almost entirely disappeared. It is with some curiosity that we read in the U. S. Census Report, for 1880, the following, such excitement having now become so completely a thing of the past:—

“The fluctuations in the price of petroleum, during the census year, rendered a speculative investment in the article an object of exciting interest. June 1, 1879, was Sunday. The market opened on the 2nd, at $74\frac{3}{8}$ cents per barrel. It continued to fall, with little disposition to rally, until on the 17th it closed at $64\frac{3}{8}$; and after fluctuating between 65 and 68 for four days, it reached 75, and dropped to $69\frac{3}{8}$ on the 25th. It hovered about 70 until the 9th of August, when it began to fall, reaching $64\frac{3}{8}$ on the 27th. A slight rally held it at about 66 until the 7th of September, when an upward movement began, reaching $96\frac{1}{4}$ on October 9th. It remained near 91 until the 10th of November, when it again moved upward, reaching $\$1.27\frac{1}{2}$ on the 21st, closing that day at $\$1.22\frac{1}{2}$. On the following day it ranged between $\$1.22\frac{1}{2}$ and $\$1.10\frac{5}{8}$, closing at $\$1.18\frac{1}{8}$, from which it rallied, reaching on the 2nd of December $\$1.28\frac{5}{8}$. Between the 10th and 18th it ranged between $\$1.27\frac{1}{2}$ and $\$1.10$, and fluctuated greatly between $\$1.18$ and $\$1.09$ from this time to January 15, 1880, when it went down in three days to $\$1.05$, and steadily declined with scarce a rally, till, on March 9, it touched $85\frac{3}{8}$. It hovered between 85 and 90 till April 6th, when it again commenced to decline, reaching $71\frac{1}{4}$ on the 21st. On the 5th of May it closed at $72\frac{1}{2}$, and by the 26th had again reached the latitude of $93\frac{3}{4}$, closing on the 31st at $98\frac{3}{4}$. It will thus be seen that the certificates of oil in tank were worth that year from $64\frac{3}{8}$ cents to $1.28\frac{5}{8}$ per barrel, and this variation of almost 100 per cent. occurred between August 27th and December 2d, an interval of only sixty-eight days.”

EXPORTS OF CRUDE PETROLEUM.

Volume of Business.—Rules Governing Exports of Crude Petroleum.

VOLUME OF BUSINESS.—Crude petroleum, as well as its products, is a staple article of commerce. In our chapter on statistics, we give in detail the quantity exported, since the inception of the industry, from both Philadelphia and the whole of the United States. The quantity exported in 1892 was, from

Philadelphia, 1,910,200 barrels (42 gallons each).

United States, 2,461,641 barrels (42 gallons each).

Nearly 80 per cent. of the total exports of the country were made from the port of Philadelphia.

Exports of crude petroleum in any considerable quantities are of a more recent growth than those of illuminating oils. The year ending June 30, 1880, shows the largest shipment of any year up to that time. The total amount was 28,297,997 gallons. Since then there has been, with the exception of one or two years, a steady increase in these exports. By 1885, they had become more than 81,000,000 gallons. By 1890, they were over 95,000,000 gallons. For the year ending June 30, 1892, they amounted to 103,592,767 gallons; and for the calendar year 1892 they were 103,388,934 gallons.

RULES GOVERNING EXPORTS OF CRUDE PETROLEUM.—The rules governing transactions in this branch of the business are those of the New York Produce Exchange, contracts for shipments from Philadelphia as well as New York being made subject to them. We give below the rules that apply to crude petroleum:—

“Crude petroleum shall be understood to be pure natural oil, neither steamed nor treated, free from water, sediment, or any adulteration, of the gravity of 43 degrees to 48 degrees Béaume.

“When crude petroleum is sold in bulk, the quantity shall be ascertained by tank measurement, at the time of delivery.

“Crude petroleum in barrels shall be sold by weight, at the rate of six and one-half pounds net to the gallon.

“In the absence of any stipulation, crude petroleum, when sold in barrels, shall be understood to mean, so far as regards packages, such packages as were originally refined petroleum barrels, whose last contents was crude petroleum, refined petroleum or naphtha.

“When contracts for crude petroleum call for second-hand refined petroleum barrels (*i. e.*, barrels whose last contents has been refined petroleum or naphtha) the sellers shall have the privilege of substituting new barrels, but they shall be glued.

“The weighing and verification of crude petroleum shall be governed by the rules applicable thereto under the head of refined petroleum.”

STATISTICS ON CRUDE PETROLEUM.

Report of the Tenth United States Census.—Report of the Eleventh United States Census.—Prices of Pipe Line Certificates.—Production of Crude Petroleum.—Shipments of Crude Petroleum.—Stocks of Crude Petroleum.—Petroleum Wells.—Pipe Line Reports.—Exports of Crude Petroleum.—Capital and Labor Employed during the Year of the Eleventh Census.

REPORT OF THE TENTH UNITED STATES CENSUS.—Two carefully prepared and, as far as such information can be made so, accurate and reliable statistical reports on petroleum are now matter of record. The first is that of Prof. S. F. Peckham for the Tenth Census of the United States, covering the period of twelve months ending May 31, 1880. The second is that of Mr. Joseph D. Weeks for the Eleventh Census of the United States, covering the period of twelve months ending December 31, 1889. Both of these reports record the difficulty of securing returns absolutely accurate, more from the nature of the problems to be considered and the lack of reliable data than the unwillingness of individuals or corporations to furnish the information desired. These reports are invaluable; and, being separated by a decade, afford some interesting comparisons.

During the census year of 1879 Prof. Peckham found that 3,080 wells were completed in the Bradford field. By adding to this number the rigs rebuilt, he estimates the total number of rigs constructed during the year as 3,516. Each rig required in building forty days of labor; equal to a total for all the rigs completed during the year, of the continued labor of 468 men through the entire twelve months. Taking 75 per cent. of this number as skilled workmen at \$2.50 per day, and the rest as ordinary laborers at \$1.50 per day, \$316,440 was expended for labor in building rigs. The material in the rigs cost on an average \$362,50 each; 31,516 rigs cost, therefore, \$958,10; which, added to the amount expended for labor, makes the total cost of the rigs in the Bradford field for that year \$1,274,550. The investment for engines and boilers could be estimated only with difficulty, on account of the moving of both from point to point as required; some of them, therefore, being old stock of little value. Prof. Peckham was of the opinion that 90 per cent. of the wells in the Bradford district were supplied with engines and 60 per cent. with boilers, and adds; "I have been informed that at least one-half the wells drilled in the Bradford district during the census year were supplied with engines and boilers from wells abandoned in the Lower Country." For these he figures no cost. He values the engines employed at \$278,200, and the boilers at \$370,800; or an average for the engines and boilers for the 3,091 wells drilled during the year, of \$210 per well. Two per cent. of the wells used for fuel the natural gas secured in drilling. Fuel for the other wells aggregated 302,400 cords of wood; the labor for cutting costing \$272,160, five hundred men being needed for this work. Only the labor of cutting is counted in the cost, as the wood was taken from the land where the

wells were drilled. Two drillers and two tool-dressers, all skilled workmen, were required for each well. He estimates that a year's labor of a skilled workman should be figured for every two wells put down. This means, say, 1,500 men for the year; or, at \$3 per day, \$1,350,000. There were required, in addition, 1,500 laborers; earning, say, \$810,000. Drilling tools cost about \$900, and were damaged to the extent of one-fourth of their value in drilling; each well representing, for the census year, an investment of \$694,350. This amount shows the cost of the work to the driller. Most wells were drilled by contract. The well owner paid for drilling deep wells (averaging 2,000 feet each) 55 cents per foot. This represents, for the 3,086 wells drilled, \$3,394,600. Prof. Peckham confesses: "Such estimates are hardly worth the name of statistics; but are, I believe, as close an approximation to accuracy as can now be made."

Each well required 30 to 100 feet of eight-inch pipe, 300 feet of 5½ inch casing, and 2,000 feet of two inch oil tubing. The drive-pipe cost about \$648,060; and the tubing, \$925,800. He added for torpedoes \$300 per well, or \$925,800 for the year. His estimates, which cover the Bradford field only, are, then:—

Cost of 3,516 rigs,	\$1,274,550
Engines and boilers for 3,091 wells,	649,000
Drilling 3,086 wells,	3,394,600
Piping 3,086 wells,	2,036,760
Torpedoing 3,086 wells,	925,800
Total for Bradford field for census year,	<u>\$8,280,710</u>

Similar figures, which we will not give in detail, show, for the 335 wells drilled in the Lower Country, in the census year, an investment of \$690,937. In addition to this, there was a large force of men employed in operating and repairing wells already drilled. Prof. Peckham put this at 2,000 men for the Bradford field, receiving \$1,080,000 for wages during the census year; for the lower country, 4,500 men, receiving \$2,700,000 in wages. He gives similar estimates for the minor districts of Franklin and Beaver district fields. These figures can be tabulated as follows:—

[TABLE D.]

STATISTICS OF CAPITAL AND LABOR EMPLOYED IN THE PRODUCTION OF
CRUDE PETROLEUM DURING THE YEAR ENDING MAY 31, 1880.

	Bradford district.	Lower Country district.	Franklin district.	Beaver county district.	Total all districts.
Number of wells drilled,	3,080	335	120	15	3,550
Cost of rigs,	\$1,274,550	\$121,437	.....	.....	\$1,395,987
Cost of engines and boilers,	\$649,000	\$100,500	.....	\$16	\$749,515
Cost of drive-pipe,	\$462,900	\$50,250	.....	.....	\$513,150
Cost of casing,	\$648,060	\$70,350	.....	.....	\$718,410
Cost of tubing,	\$925,800	\$67,000	.....	.....	\$992,800
Cost of torpedoes,	\$925,800	.....	.....	.....	\$925,800
Cost of drilling,	\$3,394,600	\$281,400	.....	.....	\$3,676,000
Total cost of wells,	\$8,280,710	\$690,937	\$48,000	\$10,500	\$9,030,147
Estimated number skilled workmen,	1,851	208	15	12	2,086
Estimated number ordinary laborers,	4,117	4,736	155	63	9,071
Total number men employed,	5,968	4,944	170	75	11,157
Total amount of wages paid,	\$3,828,600	\$3,012,300	\$102,000	\$45,000	\$6,987,900

The cost of raising oil during the census year 1879 was given: For flowing wells in the Bradford district, as 6 to 8 cents per barrel; for pumping wells in the Lower Country, 80 cents per barrel; for pumping wells in the Franklin district, \$3.00 per barrel.

REPORT OF THE ELEVENTH UNITED STATES CENSUS.—Ten years later, for the Eleventh United States Census, Joseph D. Weeks, Esq., collected statistics which, as might be expected, are much more complete and accurate. In New York and Pennsylvania, 5,435 wells were completed during the census year, which, in the case of his report, includes the twelve months ending December 31, 1889. Ten years before, the number of wells completed in the census year was 3,550. The number of producing wells at the end of the census year was 31,768, as compared with 14,384, at the end of the census year ten years before. The total number of laborers employed in producing crude oil was 19,691, as compared with 11,157 ten years before. The total wages paid was \$7,288,736, as compared with \$6,987,900 ten years before. It is difficult to carry the comparison in detail much further. Prof. Peckham limited his inquiries to labor statistics; Mr. Weeks's inquiries were more comprehensive, and his figures cover much more than those of the Tenth Census report. Mr. Weeks secured valuable information on the cost of drilling wells by contract in the Upper district, from Mr. J. S. Wilson, secretary of the well drillers' association, at Titusville. Coming from this source, such figures are of much interest; so we quote them somewhat at length:—

“Cost of rig, from \$275 to \$325; lumber in rig, from 8,000 to 10,000 feet, worth \$8 to \$11 per thousand; iron, \$70 to \$80; timber, besides the lumber mentioned above, \$30 to \$50; carpenters' work and grading, \$75 to \$90; carpenters' wages from \$2 to \$3.50 per day of ten hours.

“Relative to the cost of machinery, it is difficult to give exact information, as it is not known just how long machinery will last, its work being divided between drilling and pumping. Drilling machinery rents for drilling purposes, however, at from 10 to 15 cents per foot of drilling done, or from \$50 to \$75 for 30 days, the machinery including boiler, engine, pipes and fittings, belt and bull rope. Boilers used in the oil region cost from \$275 to \$425, engines from \$150 to \$180, belts from \$30 to \$50, bull ropes from \$15 to \$20, and pipes and fittings from \$5 to \$10.

“Drilling costs in the Upper region from 40 to 50 cents per foot. This includes cost of labor, fuel, wear and tear of materials, and rent of tools, including ropes, the first cost of tools and rope being from \$800 to \$1,000. The depth of the new wells of the Upper region is from 600 to 1,000 feet, the time consumed in drilling being from 8 to 15 days of 24 hours each, drilling being continued night and day. The cost of labor is as follows: Two drillers, at from \$3 to \$4.50 per day of 12 hours; two tool dressers, at from \$2.50 to \$3.50 per day; fuel 4 to 5 cents per foot of well drilled, and casing from 30 to 45 cents per foot. The amount used is from 150 to 400 feet. Tubing used, according to depth of well, at from 13 to 17 cents per foot; fittings per well, \$12 to \$25; sucker rods, 5 to 7 cents per foot. The amount of sucker rods used is

the same as tubing, varying with the depth of the well. The cost of drilling given above includes putting into the well the casing, tubing and rods, but not the furnishing of them.

"When the well is to be torpedoed, from 20 to 180 quarts of nitro-glycerine are used, worth from 90 cents to \$1 per quart."

TABLES.—The following tables have been prepared with all possible care, and are probably the most accurate and complete ever published. We are indebted for assistance in their preparation to the *Derrick Hand Book of Petroleum*, to *Stowell's Petroleum Reporter*, the Statistical Bureau of the United States Treasury Department, to the Tenth and Eleventh United States Census Reports on Petroleum, and to the careful records of the National Transit Company and other branches of the Standard Oil organization. Our tables are the following:—

TABLE E.—*Daily prices of Pipe Line certificates from January 1, 1880, to December 31, 1892.*

We believe a daily report of these prices has never before been published for so long a period. The figures are of interest and importance, as storage charges on oil covered by certificates are dependent, to a degree, on the ruling prices for certificates on the exchanges. With crude oil at less than \$1.00, the storage charges are 25 cents per day per 1,000 barrels; with certificate prices at more than \$1.00 and less than \$1.50, they are 35 cents; with certificate prices at more than \$1.50 they are 40 cents per day; no change, however, is to be made in the rate of storage unless the price remains above or below the specified point for thirty consecutive days.

TABLE F.—*Average monthly and yearly prices of Pipe Line certificates from January, 1885, to December, 1892.*

We think this table covers a longer period than any that has been published to show the price of certificates.

TABLE G.—*Production of crude petroleum in the Pennsylvania fields, by districts, during the year 1888.*

TABLE H.—*Production of crude petroleum in the Pennsylvania fields, by districts, each month, during the year 1889.*

TABLE I.—*Production of crude petroleum in the Pennsylvania fields, by districts, each month, during the year 1890.*

TABLE J.—*Production of crude petroleum in the Pennsylvania fields, by districts, each month, during the year 1891.*

TABLE K.—*Production of crude petroleum in the Pennsylvania fields, by districts, each month, during the year 1892.*

It will be seen by the above tables that the producing territory is shifting from year to year, the classification or districting of the production being also somewhat different from year to year.

TABLE L.—*Total production of crude petroleum in the Pennsylvania fields, by months, from January, 1871, to December, 1892.*

TABLE M.—*Production of crude petroleum in the Pennsylvania fields, by districts, each year, up to December 31, 1880, as classified by Prof. S. F. Peckham for the Tenth United States Census Report.*

For explanation of this table see page 23.

TABLE N.—*Production of crude petroleum in the Pennsylvania fields, by districts, up to December 31, 1882, as classified by the Second Geological Survey.*

For explanation of this table see page 24.

TABLE O.—*Shipments of crude petroleum from the Pennsylvania fields by months, from January, 1871, to December, 1892.*

In some years, especially the earlier ones covered by this table, a considerable portion of the oil was shipped as refined. In this table that is reduced to its equivalent in crude, a barrel of refined being figured as produced from $1\frac{1}{2}$ barrels of crude. For the later years these shipments are chiefly what are known as Pipe Line deliveries. These figures are not to be taken as showing the actual consumption, as sediment, dump-oil (oil that does not pass through the pipe lines) and oil destroyed by fire and disposed of in other ways than by refining or direct consumption, should be added. There is also loss by evaporation and other causes provided for by the pipe lines in receiving the oil from the producers, 44 gallons being delivered and certificates issued for 42 gallons only to the barrel.

TABLE P.—*Stocks of crude petroleum in the Pennsylvania fields, by months and years, from January, 1871, to December, 1892.*

TABLE Q.—*Number of wells completed in the Pennsylvania fields, each month, by districts, during the year 1888.*

This table shows also the number of dry holes.

TABLE R.—*Number of wells completed in the Pennsylvania fields, each month, by districts, in 1889.*

TABLE S.—*Number of wells completed in the Pennsylvania fields, each month, from January, 1872, to December, 1892.*

TABLE T.—*Number of drilling wells in the Pennsylvania fields, at the close of each month, from January, 1871, to December, 1892, by months and years.*

TABLE U.—*Report of the National Transit Company, and certain other pipe lines, for the month of December, 1892.*

TABLE V.—*Report of the Tide Water Pipe Company, Limited, for the month of December, 1892.*

TABLE W.—*Quantity and value of crude petroleum exported from the United States, each year, from July 1, 1863, to June 30, 1892.*

TABLE X.—*Quantity and value of crude petroleum exported from Philadelphia, each year, from July 1, 1863, to June 30, 1892.*

TABLE Y.—*Quality and value of crude petroleum exported from each port, each year, from July 1, 1863, to June 30, 1892.*

TABLE Z.—*Capital invested in the production of crude petroleum in 1889; value of material used in pumping, caring for and operating wells, and average value of wells.*

This table is compiled from the census records for 1889. There were 873,393 acres of oil lands owned and leased. The average of the values reported is only \$31.00 per acre Mr. Weeks comments:—

“It is evident to anyone at all acquainted with oil land that these averages are very much below the actual value of this territory as soil land. This class of land is worth to-day all the way from \$100 to \$400 an acre.

“Recent purchases in the Bradford district, one of the oldest, have been as high, where the fee has been bought, as \$100 to \$250 an acre, while it is almost impossible to place a value upon oil lands in the Washington district, or in several of the newer ones of the Southwestern fields. As is stated elsewhere, land was bought in 1889 at a valuation of \$1,500 for each barrel of daily production.

“In leasing oil lands it is usual to pay a certain price for the lease, varying from \$1 to \$20 per acre, together with a certain proportion of the oil produced as royalty. This royalty varies from one-sixteenth to one-fourth of the oil produced, the almost universal custom being one-eighth. In estimating the worth of the oil land, the value seems to have been put by the producer, so far as it relates to the leased land, at the amount paid per acre for the lease, while probably a fair price, though a low one, has been placed upon the land owned. It is evident, however, that this valuation is not a fair one, as certainly it should be estimated with some reference to the price paid for land, when purchased in fee, having in consideration at the same time the amount of oil produced. Under these considerations it is believed that \$100 an acre would be a very conservative estimate as the average value per acre of the owned and leased oil lands in Pennsylvania. At this figure the value of these lands would be \$87,339,900 instead of \$27,184,857.”

TABLE AA.—*Total capital invested in production of crude petroleum in the Pennsylvania fields in 1889, other than that invested in lands, wells etc., covered by table Z.*

The items of tank cars and pipe lines do not include those owned by pipe line companies, or transportation companies, but only the property owned at the wells. This table shows a total of \$62,377,151; which, added to the value of land, \$27,184,857, makes a total investment in production of crude oil of \$89,562,008. This investment would be increased to \$149,717,051, if Mr. Weeks's estimate of the value of the producing land is accepted.

TABLE BB.—*Classes of labor and wages paid in the Pennsylvania oil fields in 1889, by districts.*

TABLE CC.—*Employments of labor in the Pennsylvania oil fields in 1889, by districts.*

This shows a total of \$7,423,781 paid for labor in the census year 1889.

[TABLE E.]

DAILY PRICE OF PIPE LINE CERTIFICATES,

1880.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
January. . . . .	...	...	...	...	1 11½	1 12½	1 12½	1 12½	1 13½	1 13½	...	1 13½	1 13½	1 13½	1 10½
February. . . . .	...	1 09	1 07½	1 09	1 10½	1 09½	1 09	...	1 09½	1 08½	1 08½	1 08½	1 05½	1 05½	...
March.	92½	91	92½	81	90½	89½	...	87½	86	87½	87½	89½	88½	...	91½
April.	85½	85½	86½	...	86½	85½	83½	81½	79½	77½	...	75½	74	73½	73½
May.	73½	...	73½	72½	72½	75½	76½	77½	...	78½	75½	77½	75½	76½	77½
June.	84½	90½	91½	94½	94½	...	95½	95½	94½	92½	94	93½	...	93½	94½
July.	1 08½	1 14½	...	...	...	...	1 13½	1 12½	1 12½	1 07½	...	1 05½	1 04½	1 03½	1 01
August. . . . .	...	96½	94	94	94½	95½	94½	...	93½	90½	86½	85½	87½	88½	...
September.	89½	89½	90½	89½	...	91	92½	93½	93½	95½	95½	...	94	95½	95½
October.	99	98½	...	96½	94½	95½	99½	99½	98½	...	99	99	97½	95½	97½
November.	95½	...	93½	91½	92½	90½	...	90½	89½	89½	89	88½	87½	...	88½
December.	91½	92½	93½	92½	...	93½	92½	90½	92½	92½	91½	...	91	91½	92½

1881.

January. . . . .	...	...	95½	94½	95½	96½	95½	96½	...	96½	97½	97½	97½	97½	96½
February.	91	90½	90½	89½	89½	...	90½	90½	89½	89½	90½	90½	...	90½	90½
March.	85	85½	85½	86	86½	...	87½	88½	86½	85½	84½	84½	...	85½	84½
April.	81½	81	...	82½	84	84	85½	91½	91½	...	87½	85½	86	86½	...
May. . . . .	...	80½	80½	79½	79	80½	81½	...	80½	82½	81	81	80½	81½	...
June.	81½	82½	82½	82½	...	82½	82½	83½	83½	82½	82½	...	82½	82½	82½
July.	79	77½	...	...	78½	77½	78½	79½	78½	...	78½	76½	75½	75½	74
August.	76½	76	76½	77½	76	76½	...	76½	75½	74½	75½	75½	75½	...	79½
September.	84½	85½	86	...	85½	85½	87½	...	89	92½	...	96½	99	97	95½
October.	93½	...	93½	94½	93½	93	92½	92½	...	92½	94½	94½	94	94½	94½
November.	85	85½	85½	84½	83½	...	83½	...	84½	84½	84½	84½	...	84	83½
December.	81½	81½	83	...	86½	83½	83½	85½	84½	85½	...	87½	85½	84½	84½

1882.

January. . . . .	...	...	80½	79½	81½	81½	81½	...	81	81½	81½	81½	81½	81½	...
February.	87½	88½	87½	87½	...	86½	85½	85½	86½	87½	86½	...	87½	86½	85½
March.	81½	82½	82½	81½	...	80½	80	79½	78½	79½	81½	...	81½	80	80½
April.	80½	...	78½	78½	77½	78½	...	79½	...	78½	78	78½	79½	79½	78½
May.	73½	74½	72½	72½	72½	73½	...	74½	72½	75½	75½	75½	74½	...	74
June.	60½	60½	57½	...	57½	57½	57½	56½	54½	53½	...	52½	54	53½	51½
July.	52½	...	...	...	50½	49½	53	55½	...	58½	56½	58½	57½	57½	57½
August.	61½	60	59½	60½	60½	...	60	59½	60½	61½	60½	60½	...	59½	59
September.	55½	54	...	54½	55½	58½	57½	59½	57½	...	61½	63½	64½	67½	68½
October. . . . .	...	96½	92½	96½	92½	92½	95½	...	90½	93	94½	95½	95½	96½	...
November.	95½	96½	1 04½	1 19½	...	1 25½	...	1 14½	1 29½	1 24½	1 26½	...	1 25½	1 27½	1 28½
December.	1 10½	1 09½	...	1 08½	1 04½	1 09½	1 15½	1 12½	1 11	...	1 09½	1 08½	93	92½	95½

FROM JANUARY 1, 1880, TO DECEMBER 31, 1892.

1880.

16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Aver- age.
1 03½	1 07½	...	1 06	1 06	1 08½	1 07½	1 07½	1 10½	...	1 11½	1 09	1 07½	1 08½	1 12½	1 10½	1 10½
1 04½	1 03½	99½	97½	95½	95½	...	...	94½	92½	95½	97½	94	...	...	...	1 03
91½	83	87½	89½	89	...	89½	89½	89	88½	...	87½	...	87½	88½	88½	89½
74	74½	...	74½	72½	71½	71½	72½	72½	72½	72½	72½	73½	74	74	...	77
...	81½	81	86½	85½	82½	81	...	...	87½	91½	90½	91½	...	...	...	80½
94½	94½	96	1 04½	...	1 17½	1 18½	1 13½	82½	1 08½	1 15½	...	1 13½	1 12½	1 08½	...	1 00½
1 04½	1 01	...	97½	96½	91½	94½	96½	1 03½	...	91½	94½	97½	97½	94½	93½	1 01½
87½	89	88½	87½	89	90½	...	96	94	87½	89½	91½	91	...	90½	90½	90½
94½	96½	99	...	1 07½	1 01	99½	98½	91½	97½	...	99½	99½	99	1 00½	...	96
98½	...	99½	97½	97½	97½	96½	96½	96½	95½	92½	93½	93½	93½	94½	...	96½
89½	91	93½	91	91	...	92½	94	94	...	90½	91½	...	92½	94½	...	91½
91½	92½	91½	...	92½	92½	92½	91½	92½	...	...	92½	93½	96	97½	96	92½

1881.

...	97½	97½	96½	95½	94	94	...	92½	91½	92½	93½	92½	92½	...	92½	95
91	91	89½	89½	...	90½	...	89½	89	87½	87½	...	86½	...	...	...	89½
84½	84½	83½	81½	...	80½	80½	80½	77½	77½	77½	...	77½	81	79½	79½	83½
82½	...	79½	82½	82½	82½	84½	85½	...	87½	87½	83½	83½	83½	83½	...	84½
83½	81½	82½	82½	82½	84	...	84½	83½	82½	83½	82½	82½	...	...	81½	87½
82½	82½	82½	...	81½	80½	81	81	81	80½	...	79	78½	77½	77½	...	81½
74	...	74½	72½	73½	74½	76½	75½	...	78½	80½	77½	77½	77½	77½	...	76½
77½	78½	79½	82½	82½	...	79	79½	82½	81½	81½	82½	...	83½	86	86	79
93½	94	...	97½	98½	97½	96½	93	93½	...	...	92½	93½	95½	93½	...	92½
...	95½	95½	94½	93½	94½	92½	...	91½	90½	88½	88½	89½	88½	...	87	92½
82½	81	81½	82	...	83	82½	81½	...	81	80½	...	78½	77½	79½	...	82½
82½	83½	...	84	82½	83	82½	83½	...	...	...	84	84½	83½	83	82½	83½

1882.

81½	83½	82½	84½	86½	85	...	83½	85½	85½	86½	86½	85½	...	85	86½	83½
85½	84½	84½	...	83½	82½	...	80½	82	83½	...	82½	82	...	...	...	85½
80½	80½	80½	...	79½	79½	80	81½	82½	82½	...	83½	83½	82½	80½	80½	81
...	79½	79½	78½	78½	78½	78½	...	78½	77½	77½	76½	76½	75½	...	...	78½
73½	73½	71½	65½	68	...	66½	63½	64½	64½	64	63½	...	60½	...	56½	69½
52½	52½	...	52½	52½	52½	53½	53½	53	...	52½	52½	53½	52½	52½	...	54½
...	57½	57½	58½	57½	58½	59½	...	62	62½	60½	57½	61½	62½	...	61½	57½
59½	59½	59½	58½	...	57½	57	56½	57½	55½	54½	...	56½	57½	56½	56	58½
74½	...	82½	77½	76½	77½	82½	87½	...	88½	86½	84½	86½	89½	95½	...	71½
92	93½	94½	93½	93½	93½	...	92½	91½	91½	92½	95½	95½	...	95½	94½	96½
1 25½	1 15½	1 18	...	1 17½	1 18½	1 13½	1 04½	96½	1 00½	...	1 08½	1 04½	1 10½	...	...	1 14½
93½	...	95½	84½	81½	85½	81½	78½	...	...	75½	76½	78½	86½	91½	...	95½

[TABLE E.]

DAILY PRICE OF PIPE LINE CERTIFICATES FROM
1883.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
January.		88½	85½	85½	86½	88½		88½	89½	90½	90	90½	90½		91½
February.	1 01½	1 02½	1 01		1 01½	1 04½	1 03½	1 03½	1 04½	1 02½		98½	1 00½	98½	99½
March.	98½	97	96½		96	93½	92	88½	89½	93½		1 00½	99½	98½	98½
April.		94½	95½	94½	92½	91½	92		88½	90	96½	96½	94½	93½	
May.	92½	92½	92½	92½	91½		92½	93	94½	93½	92½	95		97½	1 01½
June.	1 19½	1 20		1 14½	1 11½	1 17½	1 17½	1 15½	1 18½		1 16½	1 16½	1 17½	1 18½	1 19½
July.		1 16½	1 14½		1 14½	1 12½	1 12½		1 13½	1 13½	1 12	1 11½	1 07½	1 05½	
August.	1 05½	1 06½	1 08½	1 07½		1 10½	1 10½	1 10½	1 10	1 10½	1 09½		1 08½	1 08½	1 11½
September.	1 09½		1 08	1 07½	1 08½	1 08½	1 07½	1 08½		1 10½	1 13½	1 14½	1 13	1 12½	1 14
October.	1 14½	1 13½	1 13½	1 14	1 13½	1 13½		1 11½	1 11½	1 09½	1 09½	1 10½	1 10		1 11½
November.	1 09½	1 09½	1 10½		1 09½		1 10	1 10	1 11½	1 13½		1 14½	1 15½	1 17½	1 18½
December.	1 16½		1 16½	1 15½	1 13½	1 14	1 15½	1 16½		1 15½	1 14½	1 14½	1 14	1 14½	1 13½

1884.

January.	1 14½	1 14½	1 14½	1 14½	. . .	1 15½	1 15	1 13½	1 13	1 11½	1 12½	. . .	09½	1 07½	
February.	1 09½	1 09½	. . .	1 09	1 10½	1 10½	1 09½	1 09½	1 09½	. . .	1 09	1 08½	1 06	1 03½	1 03½
March.	1 05	. . .	1 04½	1 04	1 00½	99	1 00½	1 02	. . .	1 00½	1 01½	1 00½	1 01½	1 00½	1 00½
April.	93	90½	91½	93½	93½	. . .	90½	92½	93½	93½	. . .	95½	. . .	94½	94½
May.	96½	99½	1 01½	. . .	1 02	96½	96½	96½	96	94½	. . .	93½	92½	81½	73½
June. . . . .	. . .	78	76½	76½	75½	75½	74	. . .	74	73½	70½	71½	71½	72½	. . .
July.	59½	61½	62	. . .	. . .	. . .	59½	60	60½	60	60½	60½	. . .	60½	63
August.	77	77	. .	74½	77½	76½	80½	79	79½	. . .	78½	78½	78½	77½	76½
September.	88½	89½	92	87½	86½	79½	. . .	76½	77½	74½	74½	75½	78½	. . .	75½
October.	73½	74½	74½	74½	. . .	74½	74½	73½	73	72½	70½	. . .	68½	62½	62½
November.	71½	. .	72½	. . .	74½	73	73½	73½	. . .	72½	73	72½	70½	68½	68½
December.	78½	79½	78	78½	75½	72½	. . .	73½	73½	72½	71½	72½	70½	. . .	72½

1885.

January.		75½	74½		73½	73½	72½	73½	72½	72½		71½	70½	70½	69½
February.		69	69	69	69½	69½	71½		71½	70½	71½	70½	70½	70½	
March.		83	80½	79½	80½	79	77½		77½	79½	80½	79½	77½	77½	
April.	81	81			79½	78	78½	77½	78½	78½	78½		79	78½	78½
May.	80	78½		78½	77½	78	77½	77½	78½		78½	78½	78½	78½	78½
June.	78½	78½	79½	79½	79½	79		79½	79½	79½	79½	79½	79½		75½
July.	92	90½	96½			98½	97½	96½	95½	97½	95½		93½	96	95
August.	98½		99½	98½	98½	99½	98½			98½	98	98½	98½	1 00½	99½
September.	1 02½	1 00½	1 02½	1 02½	1 01		1 01½	1 01½	1 00½	1 00½	1 01	1 01½		1 00½	99½
October.	1 00½	1 00½	1 00½		1 01	1 00½	1 01½	1 01½	1 01½	1 01½		1 01	1 00½	1 01½	103
November.		1 11		1 09½	1 08½	1 07½	1 08½		1 06½	1 08½	1 07½	1 07½	1 07	1 07	
December.	88½	88½	91½	90	91½		91½	90½	90½	90½	91½	90½		90½	91½

JANUARY 1, 1880, TO DECEMBER 31, 1892—*Continued.*

1883.

16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Aver- age.
91½	91½	89½	89½	89½	...	94½	93½	99½	1 04½	1 03½	1 00½	...	97½	1 00	1 02½	92½
1 01½	1 00½	...	1 00½	1 00½	1 00½	...	99	98½	...	99½	1 00½	98½	...	...	...	1 01
1 01½	1 01½	...	1 06½	1 06½	1 04½	1 03	...	98½	...	95	95½	95	98½	94½	95½	97½
95½	94½	93½	94	94½	94½	...	92½	92½	90½	86½	88	87	...	89½	...	92½
1 02	1 01½	1 02½	1 03	...	1 03½	1 03½	1 00½	1 03½	1 03½	1 05½	...	1 08½	1 11	...	1 19½	99½
1 19½	...	1 16½	1 14½	1 15½	1 18½	1 16½	1 15½	...	1 16	1 15½	1 15½	1 17½	1 17½	1 16½	...	1 16½
1 03½	1 03½	98½	1 00	1 04	1 05½	...	1 01½	1 03½	1 03	1 06	1 10½	1 07½	...	1 07½	1 08	1 07½
1 09	1 11½	1 10½	...	1 10½	1 08½	1 08	1 09½	1 08	1 06½	...	1 07	1 06½	1 07½	1 07½	1 08½	1 08½
...	1 15½	1 14½	1 14½	1 14½	1 16½	1 13½	...	1 13½	1 14½	1 16½	1 14½	1 15	1 15½	...	...	1 12½
1 10½	1 10	1 10½	1 10	1 10½	...	1 09½	1 09½	1 09½	1 11½	1 10½	1 10½	...	1 10½	1 10½	1 09½	1 11
1 17½	1 17½	...	1 16	1 18	1 17½	1 19½	1 18½	1 17½	...	...	1 17½	1 16½	...	1 16½	...	1 14½
...	1 14	1 13	1 13½	1 13	1 13	1 14½	...	...	...	1 13½	1 13½	1 13½	1 13½	...	1 13½	1 14½

1884.

1 09½	1 07½	1 09½	1 08½	...	1 08½	1 08½	1 09½	1 09½	1 10½	1 11½	...	1 10	1 10	1 12½	1 10½	1 11½
1 02	...	1 00½	1 02	1 00½	99½	...	1 00½	...	99½	99½	1 00½	1 00½	1 02½	...	...	1 04½
...	1 00½	1 00	1 00	1 00½	1 01	1 00½	...	99½	99½	99½	96½	94½	94½	...	94½	1 00
97½	97½	97½	97	...	94	93½	92½	93½	95½	94½	...	93½	94	96½	...	94
77	79	...	77½	76½	74½	76	73½	73	...	74½	79½	77	77½	...	77½	85½
71½	71½	70½	67	59½	55½	...	59½	64½	60½	62½	61½	62½	...	60½	...	68½
64½	65½	63½	63	...	62½	65	64½	64½	65½	...	63½	67½	72	70½	73½	63½
76½	...	76½	78½	79½	82½	85½	85	...	89	89	88½	92½	90½	90½	...	81½
75½	77½	76½	76½	74½	...	71½	74½	74½	75½	73½	72	...	71	73½	...	77½
64	62½	61½	...	68½	72	72½	72½	76½	79½	...	73	68½	71½	72½	72	71
...	71½	71½	71½	71½	71½	72½	...	72½	71½	72½	...	75½	78½	...	...	72½
72½	72½	73½	76½	76½	...	75½	75½	75½	...	74	73	...	74½	74½	74½	74½

1885.

68½	70½	...	69½	69½	69½	69	69½	69½	...	69½	68½	69½	69½	69½	69½	70½
70½	71½	71½	72	74½	77½	...	...	77½	80½	82½	81½	81½	...	...	...	73½
78½	79	80	82½	81½	80½	...	81½	83½	82½	82½	81½	82½	...	81½	81	80½
78½	77½	77½	...	78½	78½	77½	78½	78½	78½	...	79½	80½	80½	81	...	78½
79½	...	79½	79½	79½	80	80	80½	...	80½	80½	80½	80½	79½	...	...	79½
81½	80½	81½	81½	82½	...	82½	82½	84½	86½	87½	88½	...	92½	94	...	82½
95½	94½	94½	...	93½	93½	95½	1 00	1 01½	97½	...	98½	1 00½	99½	98½	98½	96½
...	99½	99½	1 01½	1 01	1 04	1 02½	...	1 02½	1 01½	1 02½	1 03½	1 01½	1 02	...	1 01½	1 00½
1 00½	1 00	99½	99½	...	1 00½	1 00	1 00½	1 00½	1 00	1 00½	...	1 01½	1 01½	1 01½	...	1 00½
1 07	1 07½	...	1 08½	1 11½	1 11	1 09½	1 09	1 09½	...	1 08½	1 10½	1 10½	1 09½	1 10½	1 11½	1 05½
1 07½	1 10½	1 07½	1 07½	1 04½	99½	...	91½	95½	95½	...	93½	93½	...	88½	...	1 04½
91	90½	90½	88½	...	86½	87½	88½	90½	...	...	...	88	88½	87½	88½	89½

[TABLE E.]

DAILY PRICE OF PIPE LINE CERTIFICATES FROM
1886.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
January,	91½	91½	90½	90	87½	89½	88	87½	87½	87½	87½	87½	86½	87½	
February,	82½	83½	82½	82½	83	82½	79½	77½	75½	76	76½	76½	76½	79	
March,	78½	79½	79	78½	79½	79½	79½	80	80	78½	77½	78	78½	78½	
April,	71½	71½	72	73½	73½	72½	72½	73	73½	73½	73½	73½	71½	72½	71½
May,	73½	73½	72½	73½	73½	73½	74½	73½	73½	73½	73½	73½	71½	72½	71½
June,	65½	65½	64½	65½	65	65	65	66½	65½	64½	66½	65½	65½	68½	67½
July,	66½	66	66	66	65½	65½	65½	64½	65	66½	66½	66	65½	66½	
August,	65½	65½	65½	63½	62½	61½	62½	61½	61½	61½	60½	60½	61½	61½	
September,	61½	61½	61½	62	63	62½	62½	63½	63½	62½	62½	62½	62½	63½	64½
October,	62½	62½	64½	63½	65½	64½	64½	65½	65½	65½	65½	64½	64½	64½	64½
November,	65½	66	66½	65½	65½	65½	65½	66	66½	67½	71½	74½	74½	74½	74½
December,	79½	80½	81½	81	80½	73	70	68½	68½	67½	69½	69½	70	67½	

1887.

January,	70½	69½	70½	71½	70½	71	71½	71½	71½	71½	71½	70½	71		
February,	68½	67½	67½	66½	63½	63½	62	63½	64	63½	63½	62½	60½	60½	
March,	63½	62½	62½	62½	63½	63½	62	61½	62½	63½	63	63½	63½	63½	
April,	63½	63½	63½	65½	64½	64½	65½	64½	64½	64½	64½	64½	64½	64½	
May,	66	66½	66	66½	66	66½	66½	65½	65½	64	64	63½	63½	63½	
June,	62½	62½	63½	63½	62½	62½	62½	63½	63	63½	63½	63½	62½	62½	
July,	61½	61	61	61	60½	61½	60½	60½	60½	60½	60½	60½	60½	60	
August,	57½	57	57½	57½	57½	57½	57½	58½	59	59½	60½	62	60½	60½	
September,	65½	64½	64½	65½	65½	67½	69½	69½	71	74½	68½	62½	65	65	
October,	69	67½	67½	68	68	68½	68½	69	71	70	71½	71	70½	70½	
November,	73	72½	72½	73½	73½	73½	72½	72½	73½	73½	73½	74½	73½	73½	
December,	75½	76	77	76½	76½	76½	76	77	76½	77½	77½	77½	77	77	

1888.

January,	95½	92½	94	93	94½	96½	95½	95½	96½	94	91½	91½	91½		
February,	89½	90	90½	90	89½	90	90½	89½	90	89½	88½	88½	88½	88½	
March,	94½	93½	93½	93½	98½	97½	95½	94½	96½	95½	97½	96½	97½	97½	
April,	81½	79½	78½	75½	78½	79½	79½	77½	77½	79½	80½	82½	82½	82½	
May,	86½	86	86½	86½	86	84½	85½	86½	86½	86½	86½	86½	87½	87½	
June,	77½	79½	78½	79½	80½	78½	78½	78½	76½	77½	76½	77½	77½	77½	
July,	74	73½	74½	76½	78½	79½	82½	82½	82½	83½	83½	82½	82½	82½	
August,	82	83½	83½	84	86½	88½	87½	86½	86½	86½	85½	82½	83½	83½	
September,	93½	94½	94½	94½	92½	96	96½	94½	95½	95	93½	92½	91½	91½	
October,	95½	94½	95½	95½	92½	92½	92½	92½	93½	94½	94½	94½	92½	92½	
November,	89½	84½	85	85½	86½	85½	85½	85½	86½	86½	85½	85½	85½	85½	
December,	86½	86½	86½	86½	89½	88½	88½	89½	89	89½	90½	92½	92½	92½	

JANUARY 1, 1880, TO DECEMBER 31, 1892—*Continued.*
1886.

16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Aver- age.
87½	...	87½	88½	88	88½	88½	89½	...	91½	89½	89½	87½	83½	82½	...	88½
79½	81½	80½	78½	80½	...	...	79½	80½	79½	79½	79½	...	...	...	...	80
78½	78	77½	77	76½	...	76½	76½	74	73½	73½	74½	...	73½	71½	72½	77½
75½	77½	...	76½	76½	76½	76½	...	72½	...	72½	72½	72½	72½	73½	...	74½
...	71½	67½	68½	67½	67½	67½	...	63½	64½	65½	64½	63½	63½	...	...	68½
67	67½	67½	69½	...	69½	69	69½	68½	69	69	...	68½	67½	67½	...	67
66	66½	...	66½	67½	65½	65½	66	66½	...	66½	65½	65½	65½	66	65½	66
62½	61½	60½	61½	62½	63½	...	61	61	61	61½	61½	61	...	61½	61½	62½
64½	64½	65½	...	64½	64½	65	64½	64½	64½	...	63	62½	62½	62½	...	63½
65½	...	66	66	65½	66	65	65½	...	65½	65½	65½	66½	65½	66½	...	65½
76½	75½	74½	75½	74½	...	77½	77½	76½	...	77½	78	...	77½	78½	...	72½
69½	68½	69½	...	68	66½	66½	66½	67	...	...	66½	69½	68½	69½	69½	71

1887.

...	71½	72½	72½	71½	71½	71½	...	70½	69½	70½	70½	70	70½	...	69½	71
61½	61½	60½	61½	...	63	...	65½	61½	61½	61½	...	61½	...	...	...	63½
64½	63½	63½	63½	...	63½	65	62½	63½	63½	63½	...	63½	63½	63½	63½	63½
64½	...	63½	63½	62½	63	65	63½	...	63½	64½	65½	67½	68	66½	...	64½
63½	62½	62½	62½	61½	62	...	62½	62½	62½	63½	63½	63½	...	...	63½	64½
62½	62½	62½	...	63½	63	63½	62	61½	61½	...	61½	62	61½	61½	...	62½
60½	...	60½	60	59½	59½	59½	57½	...	56½	56½	54½	56½	55½	56½	...	59½
61	61½	61½	59	59½	...	61	61½	61	61½	62½	62½	...	62½	62	64½	61
64½	64½	...	65½	64½	66½	67½	68½	68½	...	68	67½	67½	67½	68½	...	67½
...	71½	72½	74	73	74½	73½	...	71½	70	70½	70	70½	71	...	72½	70½
74½	74½	74½	74	...	74½	75	74½	...	74½	74½	...	74½	74	74½	...	74
78½	79½	...	81½	81	81½	80½	82½	84½	...	...	88½	88½	87½	87½	89½	80

1888.

89½	86½	88½	90	91½	92½	...	89	87½	88½	88½	88½	88½	...	89½	90½	91½
87½	89½	89½	...	88½	87½	...	89½	89½	91½	...	93½	92½	93½	...	...	89½
97½	97½	...	96½	95½	93½	93½	88½	90½	...	90½	90½	85½	87½	...	85	93½
86	88½	87½	86½	84½	86½	...	86½	84½	86½	85½	85½	85	...	86½	...	82½
88½	89½	88½	89½	...	88½	86½	85½	86½	86½	85½	...	85½	85½	...	82½	86½
76½	...	73	74	74½	73½	73½	72½	...	73½	72½	72½	72½	73½	73	...	76
81	81½	81½	82½	84	83½	...	84½	83½	82½	81½	81	80½	...	80½	80½	77½
83½	85½	86½	...	88	87½	86½	87½	87½	89½	...	89½	91½	92½	90½	92½	86½
...	94	94	94	92½	91½	91½	...	93½	92½	93½	94½	94½	95½	...	...	93½
92½	92½	92½	85½	85	...	87	87½	87½	85½	85½	85½	...	83½	84½	85½	90½
85	85½	...	84½	86½	85½	85½	86½	86½	...	86½	83½	85½	...	86½	...	85½
...	91½	91½	92½	93	88½	90	...	89½	...	88½	87½	86½	87	...	87½	89½

[TABLE E.]

DAILY PRICE OF PIPE LINE CERTIFICATES FROM
1889.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
January,	88½	87¾	86½	86½	86½	86	85½	86½	87½	86½	86½	86½	89½	86½	85½
February,	85½	85½	86½	86½	87½	87½	86½	88½	88½	88½	88½	88½	89½	91½	91½
March,	92½	92½	92½	91½	90½	91½	91	90½	90½	91½	91½	91½	89½	90½	89½
April,	90½	90½	91½	90½	90½	90½	90	90	90½	89½	90	90½	90½	90½	90½
May,	86	85½	84½	84½	82½	84½	82½	82½	82½	83	83½	83½	83½	82½	81½
June,	83½	82½	82½	82½	82½	83	82½	82½	83½	84	83½	83½	83½	83½	93½
July,	92½	92	91	90½	90½	90½	90½	90½	92½	92½	91½	91½	91½	92	92
August,	99½	99½	99½	99½	99½	1 00	99½	1 00	1 00½	99½	99½	97½	97½	97	97
September,	98	97½	96½	98½	98½	99½	99½	99	99	98½	99½	1 00	1 00	1 00	1 00
October,	98½	98½	98½	98½	98½	98½	98½	98½	98½	98½	98½	99½	99½	1 00½	1 00½
November,	1 05½	1 05½	1 05½	1 05½	1 07½	1 09½	1 11½	1 09½	1 09½	1 08½	1 08½	1 10	1 09½	1 10	1 10
December,	1 03½	1 04½	1 03½	1 02½	1 03½	1 03½	1 03½	1 03½	1 03½	1 04½	1 03½	1 03½	1 04	1 04	1 04

1890.

January,	1 02½	1 03½	1 03½	1 02½	1 03	1 03½	1 03½	1 05½	1 04½	1 04½	1 04½	1 04½	1 04½	1 04½	1 04½
February,	1 05½	1 05	1 05½	1 06½	1 06½	1 06½	1 06½	1 06	1 06½	1 06½	1 06½	1 05½	1 06½	1 06½	1 06½
March,	95½	94½	92½	93½	93½	94½	95	93½	93	93½	91	89½	90½	90½	90½
April,	82	82½	81½	81½	80½	80½	79½	80½	80½	81½	82½	82½	82½	82½	82½
May,	85½	85½	85½	85½	85	85	84½	84½	85½	85½	86½	87	87½	87½	87½
June,	89	87	85½	87	86½	86½	89½	90	89	89½	89½	89½	89½	89½	89½
July,	86	89	89½	89	89½	90½	91½	92	91½	90	90	92	91½	91½	91½
August,	88½	88½	88½	89	89½	90½	91½	92	91½	90	90	92	91½	91½	91½
September,	82½	82	82½	82½	82	81	79½	80	80½	81½	82	83½	83½	83½	83½
October,	78½	78	78	78	78½	79	79½	80½	80½	80½	80½	81	81	81	81
November,	78½	78½	80	78	78	76	74	74	73½	73	72½	71½	71½	71½	71½
December,	67	66½	66	68	67	66	65	65	65	64	65	65	65	65	65

1891.

January,	72½	72	73	75	73½	76½	74	73½	74	74	74½	74½	74½	74½	74½
February,	77½	76½	76½	77½	78½	78½	80	79½	79½	80½	80	80	80	80	80
March,	76½	76½	77	78½	76½	76½	76½	76½	74½	73	73½	73½	73½	73½	73½
April,	72½	73½	73	73½	73½	73½	73	74½	73	72½	73	73	73	72½	72½
May,	69½	71	71½	71½	71½	71½	72½	72	71½	70½	70½	70½	70½	70½	70½
June,	69	69½	69½	70	68½	68½	68½	68½	68½	69	69	68½	68½	68½	68½
July,	66½	66½	66½	67½	68	67½	67½	68	68	68	68	68	68	68	68
August,	62	63½	60½	60	58½	52	70	65	64½	66	69	70	69½	69½	69½
September,	64½	62	60	57½	57½	55	55½	55	55½	55½	56½	56½	56½	56½	56½
October,	58½	60½	60	60½	63½	62½	61½	60½	60½	61½	62½	61½	61½	61½	61½
November,	60	60	58½	57½	57½	57½	57½	59	61½	60	59½	59½	59½	59½	59½
December,	60	60½	60½	59½	59	58½	59	58½	58½	58½	59	59½	59½	59½	59½

JANUARY 1, 1880, TO DECEMBER 31, 1892—*Continued.*

1889.

16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Average.
85½	84½	83½	84	...	86½	86½	84½	85½	88	87	...	87	86½	85½	86½	86½
90	...	91½	90½	91½	90½	...	91	...	92½	92½	91½	91½	...	...	...	89½
89½	...	89½	90½	91½	91	91½	91½	...	92	91½	91½	91½	90½	90½	...	91
88½	84½	84½	...	85½	...	82½	81½	82½	85½	85½	84½	...	...	...	...	87½
82½	80½	81½	...	81½	82½	83	83½	84½	83½	...	84½	84½	83½	...	82½	83½
...	84	83½	83½	83½	83½	83½	...	89½	90	91½	92½	91½	92½	...	...	83½
92½	93½	95½	94½	94½	...	97½	99½	1 01½	1 00½	1 00½	1 00½	...	1 00½	99½	98½	96½
98½	99½	...	99½	99½	98½	99½	98½	97½	...	98	98	98½	98½	98½	98½	98½
99½	1 00½	99½	99½	1 00	1 00	...	99½	98½	98½	90	98½	90	...	98½	...	99½
1 00½	1 00½	1 00	99½	...	1 00½	100½	1 02½	1 03½	1 05½	1 05½	...	1 00½	1 06½	1 06½	1 06	1 01½
1 10	...	1 09½	1 09½	1 10	1 09	1 09½	1 10	...	1 06½	1 06½	1 04½	...	1 06½	1 03½	...	1 08½
1 04½	1 05	1 04½	1 03½	1 03½	1 03½	...	1 03½	1 02½	...	1 03	1 03½	1 03½	...	1 03½	1 02½	1 03½

1890.

1 05½	1 05½	1 05½	...	1 07½	1 07½	1 07½	1 06½	1 06½	1 06½	...	1 06½	1 06½	1 05½	1 04½	1 05½	1 05
...	1 05½	1 05½	1 04½	1 04½	1 05½	...	...	1 04½	1 04½	1 00½	99½	99½	...	...	...	1 05
...	88½	88	89	86½	87½	87½	...	84½	84½	84½	85½	84½	85	...	84	89½
82½	84½	84½	85½	...	83½	82½	83½	84½	84½	84½	...	84	84½	84½	...	82½
87½	89½	...	94½	95	93½	92	94	94½	...	93½	92½	90½	89½	...	90	88½
89½	89½	89	89½	89	89½	...	88½	88½	88½	87½	86½	85½	...	85½	...	88½
88½	88½	89½	90	...	89½	89	89	88½	88½	89½	...	88½	88½	89	87½	88½
92	...	91½	90½	87½	85½	85½	86	...	86½	85½	84½	84	83½	83	...	88½
81½	81½	81½	81½	80½	...	80	79½	79½	80½	80	79½	...	80½	78½	...	81½
81½	81½	82½	...	82½	80½	80½	81	80	80	...	80	79	77½	76	78½	79½
...	71	70	68½	69	68½	69	...	70	69½	68	...	67½	66	...	...	72½
64½	64½	64½	71½	68½	...	69½	68½	69	...	70	70½	...	72	71	70½	67½

1891.

74	73½	...	74	74	74	77	77½	77	...	76	74	74	74½	75	76	74
79½	78½	77½	76½	76½	76½	...	...	76	75½	75½	76	76	...	...	...	77½
73½	73½	72	72½	71½	71½	...	72½	72½	72½	73	...	72½	...	72½	72½	74½
71	70½	70	...	68½	68½	68½	69	69	...	...	69	67½	66½	66½	...	71½
68½	...	68	68½	68½	68½	68½	68½	...	67½	68½	68½	68½	68	...	...	69½
68½	68½	67½	67½	67½	...	68½	66½	66½	66½	66½	66½	...	66	65½	...	67½
67½	67½	67½	...	67½	67½	67½	68	67½	67½	...	64	62½	63	60	60	66½
...	64	66½	65½	64½	63½	64½	...	64½	64½	64½	63½	63	62½	...	62½	64½
56½	57½	59	60½	...	58½	59½	62½	61	60½	60	...	58½	57	56½	...	58½
61½	61½	...	60½	60½	59½	59½	60½	60½	...	60½	60½	59½	59½	58½	59½	60½
59½	60	59½	59½	59½	58½	...	59½	59½	58½	...	58	57½	...	58	...	59
58½	58½	59½	60	...	59½	58½	59½	59½	...	...	...	59½	59	59	59½	59½

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
January, . . .	. . .	61 $\frac{1}{2}$	. . .	62 $\frac{1}{2}$	61 $\frac{1}{2}$	61 $\frac{1}{2}$	61 $\frac{1}{2}$	62 $\frac{1}{2}$	63 $\frac{1}{2}$	. . .	63 $\frac{1}{2}$	63 $\frac{1}{2}$	63 $\frac{1}{2}$	63	62 $\frac{1}{2}$
February, . .	63 $\frac{1}{2}$	61 $\frac{1}{2}$	61 $\frac{1}{2}$	60 $\frac{1}{2}$	59 $\frac{1}{2}$	60 $\frac{1}{2}$	. . .	60 $\frac{1}{2}$	60 $\frac{1}{2}$	59 $\frac{1}{2}$	59 $\frac{1}{2}$	59 $\frac{1}{2}$	60 $\frac{1}{2}$	. . .	59 $\frac{1}{2}$
March, . . .	59 $\frac{1}{2}$	59 $\frac{1}{2}$	59 $\frac{1}{2}$	59 $\frac{1}{2}$	59 $\frac{1}{2}$	. . .	59 $\frac{1}{2}$	60	59 $\frac{1}{2}$	59 $\frac{1}{2}$	59 $\frac{1}{2}$	59 $\frac{1}{2}$	. . .	59 $\frac{1}{2}$	58 $\frac{1}{2}$
April,	56 $\frac{1}{2}$	57 $\frac{1}{2}$	. . .	57 $\frac{1}{2}$	57 $\frac{1}{2}$	56 $\frac{1}{2}$	56 $\frac{1}{2}$	56 $\frac{1}{2}$	57 $\frac{1}{2}$	. . .	58	58	58	57 $\frac{1}{2}$	. . .
May, . . . . .	. . .	58	58 $\frac{1}{2}$	57 $\frac{1}{2}$	57 $\frac{1}{2}$	57 $\frac{1}{2}$	57	. . .	57	57 $\frac{1}{2}$	57 $\frac{1}{2}$	57 $\frac{1}{2}$	57	56 $\frac{1}{2}$	. . .
June,	56 $\frac{1}{2}$	54 $\frac{1}{2}$	53 $\frac{1}{2}$	54 $\frac{1}{2}$	. . .	54 $\frac{1}{2}$	55	54 $\frac{1}{2}$	54 $\frac{1}{2}$	54 $\frac{1}{2}$	54 $\frac{1}{2}$	. . .	55	55	54 $\frac{1}{2}$
July,	53 $\frac{1}{2}$	. . .	. . .	. . .	53 $\frac{1}{2}$	53	52 $\frac{1}{2}$	52 $\frac{1}{2}$	52 $\frac{1}{2}$	. . .	53 $\frac{1}{2}$	53	52 $\frac{1}{2}$	52 $\frac{1}{2}$	52 $\frac{1}{2}$
August, . . .	52	52	52 $\frac{1}{2}$	52 $\frac{1}{2}$	51 $\frac{1}{2}$	53 $\frac{1}{2}$	. . .	53	55	55 $\frac{1}{2}$	56 $\frac{1}{2}$	57	57 $\frac{1}{2}$	. . .	57 $\frac{1}{2}$
September, .	55 $\frac{1}{2}$	55 $\frac{1}{2}$	55 $\frac{1}{2}$	. . .	55 $\frac{1}{2}$	55 $\frac{1}{2}$	55 $\frac{1}{2}$	55 $\frac{1}{2}$	55 $\frac{1}{2}$	55 $\frac{1}{2}$	. . .	55 $\frac{1}{2}$	55	54 $\frac{1}{2}$	53 $\frac{1}{2}$
October, . .	53	. . .	52 $\frac{1}{2}$	51 $\frac{1}{2}$	51 $\frac{1}{2}$	52	51 $\frac{1}{2}$	51 $\frac{1}{2}$	. . .	52 $\frac{1}{2}$	52	. . .	52	52 $\frac{1}{2}$	51 $\frac{1}{2}$
November, .	51 $\frac{1}{2}$	51 $\frac{1}{2}$	52	52 $\frac{1}{2}$	51 $\frac{1}{2}$	. . .	51 $\frac{1}{2}$	. . .	52 $\frac{1}{2}$	51 $\frac{1}{2}$	51 $\frac{1}{2}$	51 $\frac{1}{2}$	. . .	51 $\frac{1}{2}$	52 $\frac{1}{2}$
December, .	52 $\frac{1}{2}$	53 $\frac{1}{2}$	53 $\frac{1}{2}$	. . .	53 $\frac{1}{2}$	53 $\frac{1}{2}$	53 $\frac{1}{2}$	53 $\frac{1}{2}$	53 $\frac{1}{2}$	54 $\frac{1}{2}$	. . .	54 $\frac{1}{2}$	54 $\frac{1}{2}$	54 $\frac{1}{2}$	54 $\frac{1}{2}$

JANUARY 1, 1880, TO DECEMBER 31, 1892—Continued.

1892.

16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Aver- age.
63½	. . .	62¾	62½	62½	62½	63	63	. . .	62½	62½	62½	62	62½	62	. . .	62½
60	60½	60¾	60¾	60¾	. . .	. . .	59¾	58½	58½	58½	57¾	. . .	58½	. . .	. . .	60
57½	56½	56½	56½	. . .	57	55½	53½	53½	54½	55½	. . .	55	55½	55	55	56½
58¾	. . .	59¾	59½	59	59½	59¾	58¾	. . .	57¾	57½	56½	56½	56¾	56½	. . .	57½
56½	57½	56½	56	55½	56½	. . .	57½	57	56½	56¾	56½	55½	. . .	56	56½	56½
55	55	54¾	. . .	54	53¾	53½	53½	52½	52½	. . .	53	52½	52½	53	. . .	54½
52½	. . .	52¾	52	51½	52	52½	52½	. . .	52½	52½	51½	51¾	51¾	51¾	. . .	52¾
56½	55½	56½	55¾	55	. . .	55½	55½	56½	55¾	55¾	55½	. . .	55	55¾	55½	55½
54	54½	. . .	53¾	53½	53¾	54¾	54½	54½	. . .	54¾	54¾	54	53	53½	. . .	54½
. . .	51	50½	51	50½	. . .	. . .	. . .	51½	50½	51	50¾	50½	50½	. . .	50½	51½
52½	52½	52½	52½	. . .	52½	53	51½	. . .	. . .	. . .	. . .	51	. . .	50¾	. . .	52
53	53	. . .	53	53	52½	52¾	52¾	52¾	. . .	. . .	52¾	53	53	53	52½	53½

[TABLE F.] AVERAGE MONTHLY AND YEARLY PRICES OF PIPE

YEARS.	January.	February.	March	April.	May.	June.
1865,	\$8 25	\$7 50	\$6 00	\$6 00	\$7 37½	\$5 62½
1866,	4 50	4 40	3 75	3 95	4 59	3 87½
1867,	1 87½	1 85	1 75	2 07½	2 35	1 90
1868,	1 95	2 00	2 55	2 82½	3 75	4 50
1869,	5 75	6 95	6 00	6 70	5 35	4 95
1870,	4 52½	4 52½	4 45	4 22	4 40	4 17½
1871,	4 03	4 48	4 25	3 96	4 64	5 02
1872,	4 00	3 81	3 63	3 51	4 00	3 99
1873,	2 36	2 10	2 12	2 33	2 54	2 10
1874,	1 34	1 96	1 72	1 95	1 51	1 12
1875,	1 08	1 50	1 64	1 42	1 14	1 12
1876,	1 74	2 03	2 04	1 90	1 87	2 03
1877,	3 53	2 69	2 68	2 60	2 23	1 94
1878,	1 42	1 64	1 59	1 36	1 35	1 13
1879,	1 02	98	86	87	75	67
1880,	1 10½	1 03	89½	77	80½	1 00½
1881,	95	89½	83½	84½	81½	81½
1882,	83½	85½	81	78½	69½	54½
1883,	92½	1 01	97½	92½	99½	1 16½
1884,	1 11½	1 04½	1 00	94	85½	68½
1885,	70½	73½	80½	78½	79½	82½
1886,	88½	80	77½	74½	68½	67
1887,	71	63½	63½	64½	64½	62½
1888,	91½	89½	93½	82½	86½	76
1889,	86½	89½	91	87½	83½	83½
1890,	1 05	1 05	89½	82½	88½	88½
1891,	74	77½	74½	71½	69½	67½
1892,	62½	60	56½	57½	56½	54½

LINE CERTIFICATES FROM JANUARY, 1865, TO DECEMBER, 1892.

July.	August.	September.	October.	November.	December.	Yearly.
\$5 12½	\$4 62½	\$6 75	\$8 12½	\$7 25	\$6 50	\$6 59
3 00	3 75	4 50	3 39	3 10	2 12½	3 74
2 62½	3 15	3 40	3 55	2 50	1 87½	2 41
5 12½	4 57½	4 00	4 12½	3 75	4 35	3 62½
5 37½	5 57½	5 50	5 50	5 80	5 12½	5 63½
3 77½	3 15	3 25	3 27½	3 22	3 40	3 84
4 84	4 67	4 74	4 80	4 19	4 10	4 47
3 66	3 35	3 28	3 15	4 57	3 43	3 95
1 85	1 32	1 15	1 04	1 25	99	1 73
1 96	1 04	76	68	51	59	1 18
85	89	1 30	1 34	1 21	1 41	1 25
2 23	2 90	3 87	3 39	3 35	3 79	2 51
2 17	2 41	2 40	2 28	1 91	1 82	2 39
99	1 00	80	82	85	95	1 16
69	67	69	87	1 04	1 18	88
1 01½	90½	96	96½	91½	92½	94½
76½	79	92½	92½	82½	85½	85½
57½	58½	71½	93½	1 14½	95½	78½
1 07½	1 08½	1 12½	1 11	1 14½	1 14½	1 06½
63½	81½	77½	71	72½	74½	83½
96½	1 00½	1 00½	1 05½	1 04½	89½	88½
66	62½	63½	65½	72½	71	71½
59½	61	67½	70½	74	80	66½
77½	86½	93½	90½	85½	89½	87
96½	98½	99½	1 01½	1 08½	1 03½	94
88½	88½	81½	79½	72½	67½	86½
66½	64½	58½	60½	59	59½	66½
52½	55½	54½	51½	52	53½	55½

[TABLE G.]

PRODUCTION OF CRUDE PETROLEUM IN THE PENNSYLVANIA FIELDS, BY DISTRICTS, DURING THE YEAR 1888.

DISTRICTS.	Production (barrels of 42 gallons each).
Bradford and Allegany,	6,284,374.85
Forest,	204,250.37
Warren,	1,865,366.19
Butler,	3,478,387.29
Bald Ridge,	1,220,054.02
Tidioute,	660,327.87
Washington,	2,322,189.73
Greene,	9,527.54
Mount Morris,	79,278.96
Nineveh,	4,227.36
Shannopin,	301,906.04
Brush Creek,	54,778.03
Total,	16,484,668.25

[TABLE H.]

PRODUCTION OF CRUDE PETROLEUM IN THE PENNSYLVANIA FIELDS, BY DISTRICTS, EACH MONTH DURING THE YEAR 1889.
(Barrels of 42 gallons.)

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Bradford district, Pennsylvania and New York, and Allegany county, New York,	603,946	490,878	607,804	548,903	595,371	614,286	638,763	628,792	586,686	618,286	598,952	625,636	7,158,363
Forest county,	19,537	16,737	21,689	19,393	23,699	22,647	23,673	22,336	21,823	22,432	23,132	21,857	258,955
Warren county,	174,437	162,844	190,188	201,159	209,474	202,385	211,600	201,766	191,843	206,944	195,290	199,504	2,347,434
Butler and Clarion counties, etc.,	412,733	352,432	405,950	406,797	432,709	413,407	451,064	490,873	475,925	502,541	484,772	529,140	5,358,403
Tidionte and Titusville,	66,569	61,135	70,321	67,122	83,560	72,476	77,392	75,450	68,728	78,365	80,920	83,081	885,119
Allegheny county,	20,495	22,599	28,996	32,625	50,598	55,214	56,529	54,387	43,942	59,086	49,606	61,015	541,092
Beaver county,	27,361	23,230	28,159	28,092	45,796	41,071	51,675	49,354	49,545	57,670	78,007	122,776	602,736
Washington county,	185,516	171,165	244,474	301,799	349,192	357,033	401,325	397,093	376,007	363,830	351,509	349,202	3,848,145
Greene county,	24,707	23,873	22,383	21,836	23,527	24,792	33,819	36,767	38,768	42,719	44,176	55,545	392,912
Franklin district,	5,088	5,172	6,280	5,790	5,373	5,757	5,911	4,992	5,927	4,880	5,091	5,015	65,276
Smith's Perry district,	2,417	2,417	2,417	2,417	2,417	2,417	2,417	2,417	2,416	2,416	2,416	2,416	29,000
Total,	1,542,806	1,332,482	1,628,661	1,655,933	1,821,776	1,811,485	1,954,168	1,984,227	1,867,610	1,959,169	1,913,871	2,055,247	21,487,435

[TABLE I.]
 PRODUCTION OF CRUDE PETROLEUM IN THE PENNSYLVANIA FIELDS, BY DISTRICTS, EACH MONTH DURING THE YEAR 1890.
 (Barrels of 42 gallons.)

DISTRICT.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Allegheny, N. Y.,	98,611	94,470	109,045	100,075	111,562	103,754	110,346	99,854	98,886	102,499	96,123	94,238	1,219,463
Bradford, Pa.,	535,653	484,212	531,827	534,888	557,380	533,281	549,993	520,410	514,647	516,656	488,132	502,648	6,269,727
Middle District,	144,213	173,704	233,291	193,004	145,348	147,077	145,629	141,850	140,519	141,532	130,818	132,916	1,869,921
Clarendon,	11,296	17,572	18,254	17,092	25,940	20,358	25,474	21,476	19,182	36,910	27,505	25,383	266,452
Tioma,	66,184	62,562	61,112	61,086	58,988	60,229	52,253	53,737	46,643	54,422	46,167	44,545	667,928
Tidoute and Titusville,	64,620	61,084	63,299	69,191	68,029	67,673	69,094	72,152	73,092	77,289	74,924	76,541	836,988
Grand Valley,	18,723	15,840	16,807	20,560	19,832	19,390	21,608	19,706	20,981	21,359	19,689	18,585	233,080
Tarkill and Egypt, . .	92,585	89,446	96,010	100,169	105,792	104,791	112,456	105,844	108,798	111,434	90,488	105,481	1,232,294
Second Sand,	16,057	14,657	16,914	21,517	17,939	23,036	21,466	17,537	20,323	17,985	19,363	18,793	225,587
Haltday Run,	3,992	4,191	4,247	3,978	5,694	5,149	6,361	5,551	6,003	6,244	5,542	6,384	63,426
Bullion,	7,346	7,058	6,951	11,323	12,018	13,562	24,826	31,819	21,408	20,188	15,339	14,265	180,163
Lower District,	428,824	402,820	454,041	464,715	516,531	517,016	564,596	582,289	589,486	653,222	600,206	598,738	6,372,484
Washington county, . .	363,589	330,550	373,388	363,480	376,026	351,060	337,448	319,750	299,504	283,545	254,945	247,202	3,900,487
Beaver county,	126,314	144,832	164,468	138,833	122,159	117,536	118,357	116,697	108,494	110,103	92,189	88,157	1,448,139
Greene county,	59,194	65,359	60,577	56,852	58,096	56,213	61,468	79,371	99,309	119,483	116,545	123,563	956,030
Allegheny county, . . .	58,259	54,089	76,046	123,928	129,959	175,524	298,861	246,104	304,719	400,459	430,450	478,642	2,707,039
West Virginia,	38,644	38,061	44,842	39,804	39,160	35,610	34,096	31,505	50,342	46,387	45,062	49,065	492,578
Eastern Ohio, . . . . .	.....	925	422	442	721	975	648	387	637	419	554	617	6,747
Macksburg, O.,	36,713	40,712	53,193	60,729	80,167	98,268	118,182	132,173	140,634	130,224	113,664	95,675	1,108,334
Total,	2,170,817	2,102,144	2,384,744	2,381,666	2,451,341	2,450,502	2,603,161	2,598,212	2,666,757	2,858,380	2,676,705	2,721,438	30,065,867

[TABLE J.]
PRODUCTION OF CRUDE PETROLEUM IN THE PENNSYLVANIA FIELDS, BY DISTRICTS, EACH MONTH DURING THE YEAR 1891.
(Barrels of 42 gallons.)

District	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total
Allegheny, N. Y.,	106,951	85,457	98,886	100,211	93,065	100,897	96,655	93,349	89,720	88,658	75,230	92,495	1,121,574
Bradford, Pa.,	518,674	439,831	478,498	478,242	460,652	468,375	456,516	449,891	429,207	429,358	396,275	446,899	5,452,418
Middle District,	139,911	118,239	135,376	124,195	138,935	139,103	139,880	132,782	125,780	120,667	106,598	115,140	1,555,606
Clarendon and Warren,	32,424	39,123	39,146	30,375	34,650	23,213	14,833	25,183	20,378	34,471	32,526	33,905	360,227
Tiona,	48,116	41,822	45,979	52,006	56,816	44,743	40,915	50,345	40,735	46,015	39,452	46,786	553,730
Tidoute and Titusville,	78,588	67,629	73,770	69,941	66,788	71,719	72,170	69,919	69,122	68,831	65,573	63,237	837,287
Grand Valley,	19,669	16,006	18,971	17,163	17,527	17,118	17,125	16,690	15,901	15,883	13,721	13,230	196,954
Tarkill and Egypt, . . .	107,529	94,186	97,435	99,258	90,263	96,302	95,028	92,234	95,970	. . . . .	. . . . .	. . . . .	808,275
Second Sand,	20,116	19,149	20,288	22,857	21,232	21,979	21,034	22,297	20,764	29,711	22,324	27,104	268,855
Halliday Run,	5,770	4,854	5,537	5,521	6,059	5,040	5,514	4,836	4,420	. . . . .	. . . . .	. . . . .	47,551
Bullion,	13,970	12,890	15,031	13,388	11,908	12,552	12,828	12,013	12,913	. . . . .	. . . . .	. . . . .	117,463
Lower District,	628,755	526,323	544,578	542,459	538,458	546,028	544,040	550,287	551,902	651,837	616,671	711,201	6,952,539
Washington county, . . .	241,395	201,059	221,400	210,760	238,452	208,756	254,040	261,721	320,652	298,187	279,024	291,832	2,997,278
Beaver county,	87,930	80,081	81,691	91,518	79,371	88,942	80,695	86,008	74,826	68,745	61,800	61,616	943,223
Greene county,	161,394	78,976	7,024	8,729	10,119	12,332	14,838	7,380	10,069	11,585	9,182	10,115	341,813
Allegheny county,	609,722	454,111	469,385	462,438	446,359	451,372	415,057	591,411	946,609	1,704,724	2,108,747	1,657,325	10,317,258
West Virginia,	48,736	123,675	229,800	225,853	231,909	223,567	220,960	238,284	219,361	219,909	207,310	214,854	2,404,218
Eastern Ohio,	397	648	1,359	919	255	1,087	965	1,175	2,726	619	4,257	8,452	22,859
Macksburg, O.,	88,664	59,972	26,938	28,442	28,680	23,927	29,606	27,653	28,865	26,917	24,171	26,189	400,024
Total,	2,958,781	2,444,001	2,611,092	2,584,345	2,541,496	2,557,052	2,532,699	2,733,458	3,079,920	3,816,067	4,062,861	3,820,380	35,742,152

[TABLE K.]
 PRODUCTION OF CRUDE PETROLEUM IN THE PENNSYLVANIA FIELDS, BY DISTRICTS, EACH MONTH DURING THE YEAR, 1892.
 (Barrels of 42 gallons.)

DISTRICTS	January	February	March	April	May	June	July	August	September	October	November	December	Total
Allegany, N. Y.	73,244	83,918	80,473	83,012	82,829	83,047	77,744	75,944	72,617	65,335	63,532	60,888	908,003
Bradford, Pa.	359,127	394,788	385,150	382,649	376,997	380,987	352,414	356,131	333,255	320,654	321,652	327,257	4,291,061
Middle District,	100,168	99,303	104,574	95,378	101,516	94,878	92,759	93,210	84,375	85,637	81,965	111,557	1,145,320
Clarendon and Warren,	21,074	21,264	26,099	21,160	19,111	31,708	19,438	27,498	21,260	28,598	16,080	19,173	272,823
Tioga	41,728	41,705	39,077	47,710	45,952	36,376	36,851	36,013	33,821	34,595	32,761	48,629	475,708
Tidionte and Titusville,	55,066	59,723	54,118	60,940	58,791	56,479	55,165	53,517	50,270	51,709	48,149	25,237	629,164
Grand Valley,	1,085	13,239	10,436	11,953	11,265	11,624	11,186	11,574	9,642	10,637	10,460	5,000	128,101
Second Sand,	21,564	24,996	24,838	26,255	22,082	25,059	23,860	23,075	22,253	18,583	19,257	20,189	272,011
Lower District,	641,576	626,499	644,968	605,061	612,637	577,539	574,629	574,949	526,986	508,970	476,070	467,819	6,837,703
Washington county, . . .	257,530	228,483	216,826	216,732	211,610	207,294	203,984	198,345	189,060	199,887	178,393	174,244	2,452,388
Beaver county,	60,233	53,203	60,627	55,809	52,977	54,382	50,129	52,278	49,560	46,478	44,342	43,354	623,372
Greene county,	8,906	10,437	10,526	8,933	8,394	9,432	6,827	8,941	7,127	7,658	7,486	7,441	102,108
Allegheny county, Pa.,	1,128,801	1,038,420	991,822	951,152	873,835	861,912	849,225	809,892	718,749	716,073	641,803	615,172	10,196,856
West Virginia,	195,262	186,205	185,218	181,458	205,892	261,650	328,235	410,864	420,632	450,907	407,196	513,567	3,807,086
Eastern Ohio,	7,948	8,425	17,741	21,281	23,230	32,853	44,649	88,175	151,543	206,005	188,391	202,505	992,746
Macksburg, Ohio, . . .	25,814	24,469	24,630	24,158	27,177	23,077	25,029	23,202	151,543	206,005	188,391	202,505	992,746
Total.	3,009,126	2,915,077	2,877,713	2,733,641	2,734,294	2,748,357	2,752,124	2,843,609	2,631,150	2,721,726	2,597,557	2,647,932	33,332,306

[TABLE L.]
TOTAL PRODUCTION OF CRUDE PETROLEUM IN THE PENNSYLVANIA FIELDS, BY MONTHS, FROM JANUARY, 1871, TO DECEMBER, 1892.
(Barrels of 42 gallons.)

	January	February	March	April	May	June	July	August	September	October	November	December	Total.
1871.	418,407	372,568	400,324	385,980	408,797	410,540	456,475	462,582	461,940	485,243	464,610	477,958	5,205,234
1872.	583,575	462,985	461,590	462,090	537,106	491,130	517,702	549,909	500,430	442,432	638,610	645,575	6,293,194
1873.	632,617	698,300	635,291	641,520	776,564	795,470	867,473	936,138	934,270	942,493	991,470	1,084,380	9,893,786
1874.	1,167,245	835,492	883,438	778,740	895,745	921,750	1,033,447	931,519	840,630	919,739	861,060	838,142	10,926,945
1875.	862,159	719,824	789,539	673,060	696,508	696,210	788,361	718,766	698,940	731,073	700,200	720,874	8,737,514
1876.	712,223	668,885	718,177	701,490	735,351	725,600	785,623	782,223	780,600	809,162	786,480	787,090	8,968,906
1877.	842,890	783,216	901,697	972,810	1,127,334	1,130,790	1,189,005	1,275,739	1,214,910	1,269,326	1,173,420	1,256,058	13,135,475
1878.	1,203,296	1,094,856	1,208,380	1,195,890	1,264,862	1,217,250	1,283,865	1,341,928	1,315,710	1,369,797	1,348,950	1,318,678	15,163,462
1879.	1,369,921	1,261,935	1,499,315	1,530,450	1,644,322	1,675,650	1,637,767	1,892,302	1,896,700	1,896,378	1,710,480	1,769,356	19,685,176
1880.	1,904,113	1,870,008	2,015,992	2,015,700	2,228,931	2,168,440	2,248,430	2,341,027	2,346,300	2,385,636	2,274,420	2,238,634	26,027,531
1881.	2,244,090	1,913,128	9,274,532	2,205,780	2,395,293	2,577,860	3,252,678	3,104,495	2,620,380	2,297,658	2,192,940	1,897,510	30,053,500
1882.	2,353,551	2,151,332	2,482,170	2,402,790	2,486,572	1,977,900	2,020,394	1,879,437	1,913,370	2,076,659	1,958,340	1,988,526	23,128,389
1883.	1,948,919	1,756,188	1,830,674	1,816,590	2,381,854	1,797,210	2,059,950	2,099,165	1,948,260	1,961,866	1,811,700	1,822,614	23,772,209
1884.	1,825,838	1,880,650	2,052,262	2,065,800	1,771,371	1,707,210	2,075,804	2,005,961	1,712,790	1,871,105	1,761,660	1,898,657	20,776,041
1885.	1,632,176	1,437,884	1,638,133	1,780,290	1,717,371	1,797,210	2,075,804	1,705,961	1,848,260	2,408,111	2,222,790	2,181,625	25,798,000
1886.	1,748,958	1,694,848	1,938,360	1,938,360	2,178,773	2,335,380	2,418,961	2,418,961	2,418,961	1,848,877	1,843,291	1,888,402	21,478,883
1887.	1,940,851	1,827,924	2,007,106	1,960,860	1,993,517	1,912,860	1,899,525	1,848,877	1,779,930	1,854,518	1,125,450	1,288,741	16,488,668
1888.	1,155,337	1,328,877	1,338,877	1,349,403	1,473,362	1,473,362	1,394,847	1,382,077	1,273,080	1,354,518	1,442,405	1,582,741	21,487,435
1889.	1,542,806	1,352,452	1,628,601	1,635,853	1,821,776	1,811,483	1,934,168	1,944,227	1,867,610	1,959,169	1,913,871	2,055,247	27,221,438
1890.	2,170,817	2,102,144	2,384,744	2,381,666	2,541,341	2,450,502	2,603,161	2,598,212	2,696,757	3,816,067	2,676,705	2,721,438	30,065,867
1891.	2,958,781	2,444,001	2,611,092	2,584,345	2,541,496	2,557,032	2,532,699	2,733,458	3,079,920	3,816,067	4,062,861	3,820,380	35,742,152
1892.	3,003,126	2,915,077	2,877,713	2,793,641	2,734,294	2,748,357	2,752,124	2,843,609	2,691,150	2,721,736	2,597,557	2,647,932	33,332,306

[TABLE M.]

PRODUCTION OF CRUDE PETROLEUM IN THE PENNSYLVANIA FIELDS, BY DISTRICTS, EACH YEAR UP TO DECEMBER 31, 1880, AS CLASSIFIED BY PROFESSOR S. F. PECKHAM, FOR THE TENTH UNITED STATES CENSUS REPORT.

YEARS.	Oil Creek divi- sion.	Pitchole district.	Central Alle- gheny di- vision.	Lower Alle- gheny divi- sion.	Tidoute dis- trict.	Clarion divi- sion.	Bradford divi- sion.	Bullion district.	Warren divi- sion.	Beaver divi- sion.	Yearly total of all districts
Total,	35,517,217	4,816,298	6,482,900	37,342,978	4,674,345	20,381,638	44,574,921	2,312,190	448,213	339,631	156,890,331
1859,	2,000										2,000
1860,	500,000										500,000
1861,	2,113,609										2,113,609
1862,	3,056,630										3,056,630
1863,	2,611,309										2,611,309
1864,	2,116,109										2,116,109
1865,	1,585,200	912,500									2,497,700
1866,	2,502,200	1,095,000									3,597,200
1867,	2,393,300	954,000									3,347,300
1868,	3,072,617	547,500	25,000								3,645,117
1869,	3,762,500	365,000	22,000	45,000	20,500						4,215,000
1870,	3,039,628	173,585	813,150	918,644	315,838						5,260,745
1871,	2,040,263	182,034	1,083,386	1,091,438	497,887	310,233					5,203,341
1872,	1,329,685	145,065	881,140	1,638,080	847,139	829,079					5,890,248
1873,	1,094,389	119,864	851,934	4,402,563	859,983	2,526,231					9,800,964
1874,	734,247	55,770	564,978	5,160,265	373,325	3,921,267					10,800,852
1875,	504,639	35,130	343,905	4,712,702	351,407	2,821,214					8,787,506
1876,	611,884	37,450	333,640	4,755,623	354,284	2,377,700	18,509	64,220	51,337		8,968,906
1877,	834,858	60,380	474,262	5,431,072	312,700	3,012,120	1,490,481	1,306,442	151,371	62,085	13,135,771
1878,	686,948	60,000	363,710	4,552,815	308,750	2,276,408	6,298,746	505,265	108,300	92,490	15,163,462
1879,	389,400	36,500	568,652	2,876,787	237,900	1,438,342	14,046,759	289,591	45,550	82,100	20,041,581
1880,	335,342	36,500	166,143	1,737,939	167,542	1,868,984	22,377,658	146,672	91,655	102,956	25,032,421

[TABLE N.]

PRODUCTION OF CRUDE PETROLEUM IN THE PENNSYLVANIA FIELDS, BY DISTRICTS, UP TO DECEMBER 31, 1882, AS CLASSIFIED BY THE SECOND GEOLOGICAL SURVEY.

(From Crew's *Practical Treatise on Petroleum*.)

YEAR.	Oil Creek division.	Central Allegheny division.	Tidoute and Fagundes division.	Beaver and Smith's Ferry division.	Pithole and Cashup division.	Butler and Armstrong division.	Charlton division.	Bradford division.	Warren and Forest division.	Bullion division.	Allegheny County division, New York.	Total barrels of forty-two gallons
1859.	2,000	75,000	5,000	20,000	900,000	1,000	2,000	1,000	55,000	1,000	2,000	2,000
1860.	120,000	170,000	50,000	20,000	900,000	5,000	2,000	1,000	55,000	1,000	2,000	200,000
1861.	1,870,000	170,000	40,000	30,000	900,000	8,000	2,000	1,000	55,000	1,000	2,000	2,110,000
1862.	2,860,000	125,000	40,000	30,000	900,000	25,000	20,000	1,000	55,000	1,000	2,000	3,055,000
1863.	2,480,000	80,000	30,000	20,000	900,000	45,000	35,000	1,000	55,000	1,000	2,000	2,610,000
1864.	2,600,000	85,000	30,000	15,000	900,000	1,000	2,000	1,000	55,000	1,000	2,000	2,721,000
1865.	1,600,000	100,000	100,000	20,000	900,000	1,000	2,000	1,000	55,000	1,000	2,000	2,130,000
1866.	2,000,000	200,000	600,000	25,000	900,000	5,000	2,000	1,000	55,000	1,000	2,000	3,732,000
1867.	1,950,000	200,000	850,000	20,000	900,000	8,000	2,000	1,000	55,000	1,000	2,000	3,583,000
1868.	2,300,000	300,000	750,000	20,000	900,000	25,000	20,000	1,000	55,000	1,000	2,000	3,716,000
1869.	3,000,000	350,000	800,000	20,000	900,000	45,000	35,000	1,000	55,000	1,000	2,000	4,351,000
1870.	2,900,000	400,000	1,000,000	20,000	900,000	900,000	310,000	1,000	55,000	1,000	2,000	5,371,000
1871.	2,200,000	800,000	1,000,000	20,000	900,000	1,700,000	850,000	2,000	55,000	1,000	2,000	6,357,000
1872.	1,700,000	800,000	1,000,000	25,000	900,000	1,700,000	850,000	2,000	55,000	1,000	2,000	5,531,000
1873.	2,200,000	800,000	900,000	30,000	900,000	5,200,000	3,900,000	2,000	55,000	1,000	2,000	9,932,000
1874.	800,000	500,000	400,000	30,000	900,000	5,200,000	3,900,000	2,000	55,000	1,000	2,000	10,883,000
1875.	550,000	350,000	350,000	35,000	900,000	4,650,000	2,750,000	2,000	55,000	1,000	2,000	8,801,000
1876.	350,000	310,000	310,000	62,000	900,000	4,700,000	2,400,000	2,000	55,000	1,000	2,000	8,015,000
1877.	800,000	450,000	300,000	92,000	900,000	5,500,000	3,000,000	2,000	55,000	1,000	2,000	13,045,000
1878.	750,000	350,000	250,000	82,000	900,000	2,800,000	1,450,000	2,000	55,000	1,000	2,000	13,367,000
1879.	500,000	250,000	250,000	103,000	900,000	2,800,000	1,400,000	2,000	55,000	1,000	2,000	15,827,000
1880.	400,000	170,000	230,000	100,000	900,000	1,700,000	1,400,000	2,000	55,000	1,000	2,000	26,048,000
1881.	350,000	150,000	220,000	100,000	900,000	1,400,000	850,000	2,000	55,000	1,000	2,000	27,238,000
1882.	280,000	155,000	135,000	80,000	900,000	1,300,000	600,000	2,000	55,000	1,000	2,000	30,460,000
Total.	33,202,000	7,200,000	9,860,000	904,000	3,378,000	39,934,000	21,827,000	85,866,000	4,196,000	2,541,000	7,055,000	216,083,000

[TABLE O.]

SHIPMENTS OF CRUDE PETROLEUM FROM THE PENNSYLVANIA FIELDS, EACH MONTH, FROM JANUARY, 1871, TO DECEMBER, 1892.

(Barrels of 42 Gallons.)

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total
1871.	437,601	347,718	383,890	389,147	567,375	501,754	541,137	528,134	551,075	505,071	480,977	410,822	5,664,791
1872.	476,966	407,605	276,220	428,512	510,417	529,228	591,238	621,954	541,007	607,468	477,945	430,786	5,899,947
1873.	573,124	527,440	668,374	708,191	768,176	696,414	814,449	864,768	952,955	1,010,852	959,589	955,443	9,499,775
1874.	843,663	501,220	518,246	803,409	899,027	815,413	940,281	733,865	1,014,570	543,341	546,117	602,348	8,821,500
1875.	453,663	327,776	693,918	729,581	681,979	745,986	904,537	882,089	1,109,392	871,917	671,066	871,902	8,942,938
1876.	677,289	519,193	623,762	603,037	646,150	921,862	1,228,539	1,203,402	1,154,549	524,190	871,496	1,190,983	10,164,452
1877.	743,461	484,904	913,919	903,525	1,234,324	1,391,124	1,096,951	1,425,943	1,563,797	1,268,971	1,205,634	600,019	12,832,573
1878.	775,791	774,234	741,512	846,632	960,894	1,135,119	1,330,454	1,655,951	1,434,225	1,747,390	1,281,410	992,688	13,676,000
1879.	663,998	702,729	973,879	1,136,188	1,331,469	1,473,081	1,923,611	1,894,129	1,627,120	1,685,933	1,226,030	1,532,565	15,886,470
1880.	1,630,409	1,395,151	1,613,371	1,842,208	1,935,259	1,973,081	1,923,532	2,214,877	2,131,950	2,080,467	2,066,906	1,903,561	20,284,235
1881.	1,061,617	915,028	1,276,746	1,346,398	1,563,436	1,728,637	2,402,970	2,047,345	1,932,171	2,089,428	1,404,640	1,121,453	21,900,314
1882.	1,637,067	1,787,909	1,718,936	1,678,134	1,827,356	2,172,685	1,634,407	2,086,478	1,935,574	2,245,421	2,065,602	1,749,547	21,979,369
1883.	1,337,815	1,250,824	1,641,899	1,908,379	1,995,634	1,747,789	1,740,021	2,000,371	2,292,087	2,510,283	2,078,261	2,382,244	23,657,537
1884.	1,686,961	1,723,261	1,873,890	1,643,336	1,899,829	1,827,553	1,961,152	2,049,099	2,116,659	2,050,150	1,857,080	2,138,253	23,713,326
1885.	1,804,028	1,895,021	1,887,034	1,823,726	2,037,039	2,034,025	2,418,961	2,059,239	2,157,323	2,441,848	2,724,736	2,550,891	26,653,852
1886.	1,991,561	2,032,794	2,055,750	2,070,468	2,032,672	2,117,489	2,418,961	2,220,768	2,342,227	2,573,008	2,462,082	2,608,341	27,279,028
1887.	2,312,067	1,995,757	2,332,324	1,938,278	2,328,564	2,165,439	2,000,173	2,223,263	2,289,486	1,558,115	2,503,491	2,337,732	25,138,031
1888.	2,265,109	2,163,957	1,979,753	1,928,435	1,773,994	1,956,115	2,098,531	2,625,263	2,567,459	2,747,284	2,303,131	2,671,518	29,638,898
1889.	2,388,609	2,272,000	2,265,120	2,236,004	2,256,120	2,268,280	2,949,597	2,625,263	2,567,459	2,725,341	2,632,898	2,889,525	30,116,075
1890.	2,146,108	2,148,977	2,148,977	2,317,410	2,474,965	2,486,205	2,640,668	2,538,224	2,648,418	2,725,341	2,682,898	2,859,778	30,193,940
1891.	2,637,339	2,268,168	2,531,832	2,248,530	2,259,531	2,259,531	2,309,531	2,579,076	2,829,480	2,900,732	2,685,570	2,859,778	31,048,944
1892.	2,436,630	2,397,479	2,773,528	2,205,693	2,338,230	2,138,309	2,262,402	2,696,880	2,828,717	2,892,191	2,978,984	3,031,791	31,048,944

[TABLE P.]

STOCKS OF CRUDE PETROLEUM IN THE PENNSYLVANIA FIELDS, AT THE END OF EACH MONTH, FROM JANUARY, 1871, TO
DECEMBER, 1892.

(Barrels of 42 gallons.)

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Averages.
1871.	537,751	587,021	642,000	771,000	605,000	554,000	511,220	530,145	541,330	495,102	502,960	532,000	567,458
1872.	532,971	579,733	662,437	877,832	950,803	1,010,302	990,229	997,166	931,410	914,423	886,909	1,084,423	869,897
1873.	1,183,728	1,265,373	1,244,657	1,178,643	1,192,451	1,324,493	1,433,620	1,513,890	1,521,185	1,452,777	1,493,875	1,625,157	1,369,162
1874.	1,948,919	2,283,032	2,648,210	2,623,534	2,394,286	2,701,625	2,273,479	2,332,444	2,758,504	3,124,902	3,449,845	3,705,639	2,755,035
1875.	4,011,703	4,546,188	4,592,364	4,537,813	4,552,672	4,502,856	4,386,720	4,223,397	3,812,945	3,672,101	3,701,235	3,550,207	4,174,189
1876.	3,585,143	3,734,835	3,829,250	3,900,703	3,989,904	3,791,642	3,326,726	3,304,405	2,930,456	3,040,108	2,953,032	2,551,139	3,411,622
1877.	2,604,128	2,880,636	3,210,454	3,279,731	3,173,008	2,912,674	3,004,728	2,852,544	2,503,657	2,504,012	2,471,738	3,127,857	2,875,434
1878.	3,555,342	3,875,964	4,342,832	4,692,090	4,996,058	5,078,189	5,031,600	4,717,877	4,509,362	4,221,769	4,289,309	4,615,239	4,301,308
1879.	5,321,222	5,813,663	6,318,069	6,683,111	6,980,064	7,263,150	7,353,382	7,114,195	7,620,525	7,794,634	8,051,469	8,470,490	7,065,894
1880.	8,724,194	9,004,062	9,606,683	10,780,153	11,916,517	13,099,934	14,116,753	15,063,651	16,137,316	16,877,019	18,025,409	18,928,430	13,525,015
1881.	20,110,903	21,108,003	22,105,789	22,963,171	23,793,028	24,441,191	24,888,337	25,005,187	25,066,657	25,309,361	25,503,285	26,019,704	23,860,051
1882.	26,716,188	27,039,611	27,822,825	28,547,481	29,206,697	29,659,952	30,715,144	31,772,094	32,400,303	32,608,533	33,728,555	34,596,612	30,419,500
1883.	35,187,116	35,692,450	35,881,255	37,789,406	35,755,824	35,985,935	36,371,922	36,164,881	35,732,677	35,613,915	35,506,653	35,745,632	35,453,975
1884.	35,884,509	36,041,898	36,220,270	36,642,794	38,631,203	38,665,838	38,985,757	39,084,561	38,740,734	38,192,317	37,925,756	37,366,126	37,698,481
1885.	37,214,274	36,737,137	36,506,236	36,464,800	36,139,072	35,872,957	35,686,909	34,939,902	34,763,857	34,668,437	34,428,841	34,532,391	35,732,291
1886.	34,186,238	34,082,715	33,823,385	33,823,385	33,969,486	34,387,577	34,428,190	35,343,771	35,061,614	35,027,877	34,525,871	34,156,605	34,350,384
1887.	33,835,389	33,288,690	32,932,502	32,955,084	32,642,350	32,386,269	32,283,269	32,008,536	31,340,939	30,692,583	29,795,131	28,006,211	31,806,015
1888.	26,927,634	26,084,574	25,404,276	24,893,223	24,658,043	24,219,496	23,586,351	22,825,298	21,876,681	20,722,024	19,734,132	18,995,814	23,326,939
1889.	18,165,607	17,240,428	16,634,437	16,076,501	15,668,331	15,258,587	14,541,686	13,893,267	13,138,432	12,408,969	12,021,924	11,562,563	14,724,756
1890.	11,060,220	10,990,417	11,170,990	11,178,990	10,962,100	10,866,587	10,663,497	10,526,613	10,346,878	10,263,258	10,080,538	9,993,600	10,682,807
1891.	9,865,182	10,028,661	10,146,204	10,528,613	10,920,899	11,247,911	11,538,715	11,768,678	12,034,521	12,930,475	14,313,737	15,354,233	11,723,152
1892.	15,902,468	16,451,731	16,735,298	17,249,534	17,051,830	18,276,895	18,694,562	18,816,683	18,844,937	18,080,523	17,730,444	17,335,389	17,655,024

[TABLE Q.]

NUMBER OF WELLS COMPLETED IN THE PENNSYLVANIA FIELDS, BY MONTHS AND DISTRICTS, DURING THE YEAR 1888.
(From data United States Geological Survey.)

MONTHS.	BRADFORD-ALLEGANY DISTRICT.			MIDDLE DISTRICT.			LOWER DISTRICT.			SOUTHWEST DISTRICT.			TOTALS.		
	Total number	Productive.	Dry holes.	Total number.	Productive.	Dry holes.	Total number.	Productive.	Dry holes.	Total number.	Productive.	Dry holes.	Total number.	Productive.	Dry holes.
January.	4	2	2	22	17	5	23	16	7	8	3	5	57	38	19
February.	1	. . . .	1	30	23	7	15	10	5	3	2	4	52	35	17
March.	2	2	. . . .	21	16	5	23	14	9	10	5	5	56	37	19
April.	3	1	2	22	15	7	11	6	5	13	7	6	49	29	20
May.	1	1	. . . .	19	16	3	16	10	6	20	17	3	56	39	17
June.	5	3	2	22	18	4	25	19	6	35	28	7	87	64	23
July.	2	2	. . . .	28	26	2	30	14	16	22	15	7	82	57	25
August.	2	1	1	27	18	9	32	25	7	35	16	9	96	60	36
September.	7	6	1	70	69	1	32	26	6	23	14	9	132	114	18
October.	8	5	3	149	118	31	44	33	11	28	19	9	229	175	54
November.	25	21	4	173	151	22	68	50	18	41	25	16	307	247	60
December.	30	25	5	181	154	27	53	36	17	38	30	8	302	239	63
Total	90	69	21	764	641	123	372	259	113	279	181	98	1,505	1,134	371

[TABLE R.]

NUMBER OF WELLS COMPLETED IN THE PENNSYLVANIA FIELDS, BY MONTHS AND DISTRICTS, DURING THE YEAR 1889.

(From data United States Geological Survey.)

MONTHS	Bradford-Alle- Kany.	Forest.	Warren.	Butler-Clarion- Venango.	Washington.	Allegheny.	Beaver.	Greene.	Total.
January,	39	4	32	180	16	7	. . . . .	6	284
February,	34	1	16	207	10	14	. . . . .	6	288
March,	52	2	38	196	49	8	. . . . .	8	353
April,	59	1	52	224	51	6	. . . . .	5	401
May,	82	4	46	207	47	34	. . . . .	11	431
June,	83	4	71	275	54	34	. . . . .	12	537
July,	107	9	62	228	60	69	. . . . .	14	549
August,	104	7	65	233	71	23	. . . . .	5	508
September,	97	2	70	222	50	5	. . . . .	6	478
October,	143	7	62	250	39	18	. . . . .	12	559
November,	121	9	72	252	56	5	. . . . .	10	540
December,	113	5	50	211	54	8	. . . . .	3	471
Total,	1,034	55	636	2,685	577	231	86	98	*5,435

* Including 36 wells drilled in Franklin district, data for which by months were not obtainable.

[TABLE S.]

NUMBER OF WELLS COMPLETED IN THE PENNSYLVANIA FIELDS, EACH MONTH, FROM JANUARY, 1872, TO DECEMBER, 1892.

YEARS.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
1872.	37	120	89	121	135	84	128	118	82	100	6	105	1,183
1873.	93	94	100	105	102	130	114	120	106	101	100	98	1,263
1874.	102	102	110	113	109	101	121	107	104	120	106	120	1,317
1875.	187	187	195	186	172	190	200	210	201	220	217	230	2,398
1876.	240	231	242	200	202	261	248	270	209	273	272	272	2,920
1877.	281	241	291	269	320	403	317	255	322	467	391	382	3,939
1878.	274	296	211	409	470	289	203	186	174	229	248	165	3,064
1879.	136	132	238	270	402	330	327	283	210	232	227	261	3,048
1880.	320	230	367	500	426	310	338	368	356	364	336	302	4,217
1881.	222	220	271	316	406	374	336	332	312	322	363	406	3,880
1882.	347	340	355	432	409	340	185	309	321	321	150	122	3,304
1883.	125	126	142	209	311	228	261	145	89	59	73	66	2,265
1884.	229	227	236	298	311	244	268	145	336	397	384	345	2,761
1885.	64	62	82	116	213	242	217	283	253	272	185	345	3,478
1886.	270	280	291	328	343	365	159	313	142	100	101	96	1,660
1887.	158	162	138	160	148	162	159	96	132	229	307	302	1,515
1888.	57	52	56	49	56	97	549	508	478	559	540	471	5,434
1889.	284	288	353	401	431	537	589	589	571	567	520	348	6,435
1890.	553	482	522	556	534	571	589	624	571	567	520	348	6,435
1891.	319	243	275	288	314	304	334	333	285	245	246	204	3,390
1892.	183	180	149	168	183	161	179	142	146	157	165	141	1,954

* Including thirty-six wells drilled in Franklin district, data for which by months were not obtainable.

[TABLE T.]
NUMBER OF DRILLING WELLS IN THE PENNSYLVANIA FIELDS AT THE CLOSE OF EACH MONTH, FROM JANUARY, 1871, TO
DECEMBER, 1892.

	January.	February.	March.	April.	May.	June.	Jul.	August.	September.	October.	November.	December.	Averages.
1871.	140	173	245	279	356	303	329	330	439	486	477	394	329
1872.	363	369	313	302	386	391	359	392	301	311	354	318	347
1873.	361	349	227	177	228	395	340	207	197	163	137	60	242
1874.	37	55	99	213	225	210	180	128	107	82	57	54	121
1875.	40	40	45	64	127	162	118	96	132	170	179	168	112
1876.	142	151	230	267	307	340	353	374	511	565	618	493	363
1877.	457	463	395	448	512	395	365	417	535	573	565	426	463
1878.	334	326	379	409	376	266	188	185	240	292	297	218	292
1879.	265	323	406	468	490	384	329	258	270	315	372	440	357
1880.	540	535	577	580	460	440	452	515	491	409	475	408	495
1881.	383	490	437	446	470	408	379	352	388	445	475	408	423
1882.	422	438	408	405	381	226	240	194	177	184	154	138	281
1883.	151	205	284	284	216	225	262	315	314	341	301	263	243
1884.	270	273	260	284	244	123	262	91	315	100	86	78	168
1885.	37	109	139	190	228	209	242	308	382	355	359	277	241
1886.	320	357	356	318	358	403	349	290	322	272	285	238	321
1887.	201	177	155	155	157	135	135	137	107	104	114	88	139
1888.	64	72	135	135	135	106	124	106	165	187	337	273	136
1889.	341	350	453	487	574	612	598	598	600	698	659	610	548
1890.	597	615	645	603	585	617	630	691	632	644	642	445	609
1891.	410	401	401	387	380	407	420	406	406	390	351	287	388
1892.	265	270	251	231	234	254	203	242	234	245	229	258	241

[TABLE U.]
SUMMARY OF STATEMENTS MADE JANUARY 10, 1893, RELATING TO BUSINESS OF VARIOUS PIPE LINES FOR MONTH ENDING
DECEMBER 31, 1892.
(In barrels of 42 gallons each.)

	Total liabilities.	Gross stock.	Sediment and surplus.	Runs from wells.	Other receipts.	Regular deliveries.	Other deliveries.
National Translt Company,	11,908,341.60	13,462,723.19	1,554,381.59	784,215.37	682,789.18	562,303.45	1,027,632.45
Southwest Pennsylvania Pipe Lines,	1,755,863.57	1,942,544.20	186,680.63	575,725.60	50,602.68	1,231.60	593,323.08
The Eureka Pipe Line Company,	594,328.24	701,214.62	106,886.38	508,183.65	218,056.09	46,807.89	582,538.85
The Buckeye Pipe Line Company, Macksburg Oil,	422,141.62	438,648.84	16,507.22	196,851.67	2,139.68	6,442.51	204,715.75
Southern Pipe Line Company,	209,192.65	227,319.71	18,127.06	. . . . .	517,428.54	538,473.89	. . . . .
New York Translt Company,	584,782.77	758,505.62	173,722.85	. . . . .	955,118.40	1,187,425.85	. . . . .
	15,474,650.45	17,530,956.18	2,056,305.73	2,064,976.29	2,426,134.57	2,342,686.19	2,408,210.13

Total liabilities of the National Translt Company consisting of outstanding acceptances and other vouchers \$8,376,252.39; Credit balances, \$5,532,079.21.

[TABLE V.]
DECEMBER, 1892. STATEMENT OF THE TIDE-WATER PIPE COMPANY, LIMITED, MADE IN COMPLIANCE WITH THE ACT OF
ASSEMBLY APPROVED MAY 22, 1878.

FIRST. Quantity of crude petroleum which was in the actual and immediate custody of said company at the beginning of the month of December, 1892, barrels, 568,013.19
Quantity of crude petroleum which was in the actual and immediate custody of said company at the close of the month of December, 1892,
showing where the same was located or held, describing in detail the location and designation of each tank or place of deposit, and the name
of its owner, viz:

DESIGNATION OF TANK.			Name of owner.	Location.	Barrels and 100lbs of bar- rels of 42 gal- lons each.
Wood or iron.	Marked.	Num- bered.			
Iron, . . .	Tide-Water Pipe Company, Limited,	12	Tide-Water Pipe Company, Limited, do. do. do. do. do. do. do. do. do. do. do. do. do. do. do.	Otto township, McKean county, Pa.	5,007.81
Do., . . .	do.	25			6,000.98
Do., . . .	do.	27			24,553.78
Do., . . .	do.	37			35,273.56
Do., . . .	do.	38			34,802.41
Do., . . .	do.	39			4,315.29
Do., . . .	do.	44			3,528.86
Do., . . .	do.	46			35,354.70
Do., . . .	do.	47			29,686.21
Do., . . .	do.	105			18,437.25
Do., . . .	do.	124			15,909.34
Do., . . .	do.	138			3,404.06
Do., . . .	do.	160			1,200.15
Do., . . .	do.	161			829.74
Do., . . .	Small tank or heater,	354			38.00
Wood, . . .	do.	339		Lafayette township, McKean county, Pa.,	867.35
Do., . . .	do.	307		do.	384.67
Do., . . .	do.	335		Foster township, McKean county, Pa.,	261.15
Do., . . .	do.	336		do.	69.00
Do., . . .	do.	337		do.	825.89
Do., . . .	do.	338		do.	1,065.18
Iron, . . .	Tide-Water Pipe Company, Limited,	3	Bradford township, McKean county, Pa.	do.	1,234.76
Do., . . .	do.	4			22,122.00
Wood, . . .	do.	316			13,493.52
Do., . . .	do.	317			77.24
Wood, . . .	do.	310		do.	66.84
Do., . . .	do.	311		Keating township, McKean county, Pa.,	321.28
Do., . . .	do.	312		do.	744.63
Iron, . . .	Tide-Water Pipe Company, Limited,	21		do.	131.36
Do., . . .	do.	24		do.	5,826.60
Wood, . . .	do.	308		do.	22,631.66
Do., . . .	do.	309	do.	do.	145.00
Do., . . .	do.	329		do.	455.86
Do., . . .	do.	330		do.	561.06
Do	do.	330	do.	do.	529.28

[TABLE V.] STATEMENT OF THE TIDE-WATER PIPE COMPANY, LIMITED—Continued.

DESIGNATION OF TANK.			Name of owner.	Location.	Barrels and 100ths of barrels of 42 gallons each.
Wood or iron.	Marked.	Numbered.			
Iron.	Tide-Water Pipe Company, Limited.	154	Tide-Water Pipe Company, Limited.	Eldred township, McKean county, Pa.	3,731.50
Wood.	do.	318	do.	do.	271.30
Do.	do.	319	do.	do.	1,057.00
Do.	do.	320	do.	do.	816.54
Do.	do.	340	do.	Sargent township, McKean county, Pa.	146.73
Do.	do.	341	do.	do.	320.33
Do.	do.	342	do.	do.	1,005.02
Do.	do.	343	do.	do.	72.84
Do.	Tide-Water Pipe Company, Limited.	51	do.	Eulalia township, Potter county, Pa.	825.92
Iron.	do.	131	do.	do.	24,012.26
Do.	do.	133	do.	Brown township, Lycoming county, Pa.	32,321.27
Do.	do.	135	do.	Beaver township, Columbia county, Pa.	32,284.08
Do.	do.	156	do.	Muncy Creek township, Lycoming county, Pa.	11,263.02
Do.	do.	321	do.	Bollivar township, Allegany county, N. Y.	202.61
Do.	do.	322	do.	do.	235.43
Do.	do.	323	do.	do.	250.77
Do.	do.	324	do.	do.	121.87
Do.	do.	325	do.	do.	409.81
Do.	do.	326	do.	do.	614.14
Do.	do.	327	do.	Alma township, Allegany county, N. Y.	418.93
Iron.	Tide-Water Pipe Company, Limited.	155	do.	Hudsondale, Carbon county Pa.	13,808.76
Do.	do.	59	do.	Bayonne, Hudson county, N. J.	34,697.47
Do.	do.	62	do.	do.	35,039.95
Do.	do.	64	do.	do.	34,117.53
Do.	do.	71	do.	do.	34,486.78
Do.	do.	72	do.	do.	34,754.82
Do.	do.	73	do.	do.	34,046.25
Do.	do.	158	do.	do.	10,601.28
Do.	do.	159	do.	Changeewater, Hunterdon county, N. J.	13,072.58
Do.	do.		do.	do.	645,479.02
Total fluid in tanks.					
MILES OF PIPE.		Inside diameter.	Capacity per mile.	Total capacity.	Estimated contents.
22½ 43	2,007 inches.	21.914 barrels.	4,961.98		2,480.99
72.50	3,067 inches.	48,247 barrels.	3,497.90		1,748.95
42.48	4,026 inches.	83,137 barrels.	3,531.65		3,531.65

	232.06	6.065 inches.	188,672 barrels.	55,103.54	49,593.18
	1.40	7.982 inches.	326,750 barrels.	437.50	437.50
	.59	12.025 inches.	741,677 barrels.	437.59	437.59
Total,					58,249.86
Total barrels,					703,728.88
Less sediment and surplus,					157,403.73
Net quantity of oil,					546,325.15

SECOND. } Quantity of crude petroleum which was received by said company during the month of December, 1892, barrels, 139,020.22

THIRD. } Quantity of crude petroleum which was received from other lines during the month of December, 1892, barrels, 59,513.80

FOURTH. } Quantity of crude petroleum for the delivery or custody of which said company was liable to other corporations, companies, associations, or persons, at the close of the month of December, 1892, barrels, 218,375.19

FIFTH. } Amount of such liability which was represented by outstanding certificates, accepted orders or other vouchers, barrels, 546,325.15

SIXTH. } Amount of such liability which was represented by credit balances, barrels, 18,000.00

SIXTH. } All the provisions of the act above referred to have been faithfully observed and obeyed during the said month of December, 1892, barrels, 528,325.15

No refined petroleum was in the custody of said company during the month of December, 1892, nor was said company liable during the month for the delivery of any refined petroleum.

W. S. BATCHELDER,
J. W. STAFFORD

COMMONWEALTH OF PENNSYLVANIA, }
COUNTY OF CRAWFORD:

Before me, a notary public, within and for said county, duly authorized by law to administer oaths, came personally W. S. Batchelder, having charge of the books and accounts of the Tide-Water Pipe Company, Limited, and J. W. Stafford, having charge of the pipes and tanks of said company, who being each duly sworn depose and say that they are familiar and acquainted with the business and condition of said company and with the facts set forth in the above report, and that the statements made therein are true to the best of their knowledge, information and belief.

Subscribed and sworn to before me this 5th day of January, 1893.

[SEAL.]

F. W. PERKINS,
Notary Public.

[TABLE W.]

QUANTITY AND VALUE OF CRUDE PETROLEUM EXPORTED FROM THE UNITED STATES, EACH YEAR, FROM JULY 1, 1863, TO JUNE 30, 1892.

YEAR ENDING JUNE 30.	GALLONS.	DOLLARS.	YEAR ENDING JUNE 30.	GALLONS.	DOLLARS.
1864.	11,125,433	4,540,631	1879.	25,874,488	2,180,413
1865.	13,330,328	7,703,969	1880.	28,297,997	1,927,207
1866.	16,803,987	6,472,876	1881.	39,984,844	3,065,464
1867.	7,905,344	2,106,284	1882.	41,304,997	3,129,511
1868.	10,717,233	1,790,660	1883.	52,712,306	3,914,941
1869.	13,425,566	2,994,404	1884.	67,186,529	5,302,974
1870.	10,403,314	2,237,292	1885.	81,037,992	5,903,833
1871.	9,859,038	1,971,847	1886.	80,246,763	5,859,577
1872.	13,559,768	2,307,111	1887.	76,062,878	4,860,382
1873.	18,439,407	3,010,050	1888.	85,538,725	5,782,008
1874.	17,776,419	2,099,696	1889.	72,987,383	5,083,132
1875.	14,718,114	1,406,018	1890.	95,450,653	6,744,235
1876.	20,520,397	2,220,268	1891.	91,415,095	5,876,452
1877.	26,819,202	3,756,729	1892.	103,532,767	5,101,840
1878.	26,936,727	2,694,018			

[TABLE X.]

QUANTITY AND VALUE OF CRUDE PETROLEUM EXPORTED FROM PHILADELPHIA, EACH YEAR, FROM JULY 1, 1863, TO JUNE 30, 1892.

YEAR ENDING JUNE 30.	GALLONS.	DOLLARS.	YEAR ENDING JUNE 30.	GALLONS.	DOLLARS.
1864.	2,087,114	670,774	1879.	4,687,786	377,197
1865.	1,110,907	488,751	1880.	2,730,147	160,549
1866.	5,096,037	1,639,991	1881.	5,326,528	351,736
1867.	3,047,117	655,575	1882.	4,454,946	288,581
1868.	3,778,871	622,677	1883.	6,959,240	460,857
1869.	1,409,603	289,202	1884.	5,557,310	400,833
1870.	3,005,916	608,415	1885.	29,542,316	2,082,561
1871.	2,588,007	442,944	1886.	33,452,742	2,327,344
1872.	5,951,795	999,064	1887.	35,892,185	2,204,847
1873.	4,981,872	821,449	1888.	39,908,874	2,530,308
1874.	4,395,953	473,020	1889.	30,440,884	1,974,204
1875.	3,662,247	324,116	1890.	45,039,903	2,803,070
1876.	8,663,564	873,592	1891.	45,307,725	2,522,317
1877.	4,262,093	558,101	1892.	65,898,042	2,908,987
1878.	4,809,278	471,871			

[TABLE Y.]

QUANTITY AND VALUE OF CRUDE PETROLEUM EXPORTED FROM EACH OF THE SHIPPING PORTS, EACH YEAR, FROM JULY 1, 1863,
TO JUNE 30, 1892.

YEAR ENDING JUNE 30.	PHILADELPHIA.		NEW YORK.		BALTIMORE.		BOSTON.		ALL OTHER PORTS.		TOTAL. ALL PORTS.	
	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.		
1864.	2,087,114	670,774	8,443,631	3,605,780	338,324	140,032	7,700	8,551	256,364	124,045	11,125,433	4,540,631
1865.	1,110,907	448,751	11,872,355	6,394,009	72,996	60,721	7,700	8,551	266,130	124,045	13,330,328	7,703,969
1866.	5,096,037	1,639,991	11,290,623	4,616,171	170,442	82,583	5,602	1,801	241,283	132,330	16,803,987	6,472,876
1867.	3,047,117	658,875	4,463,004	1,293,311	157,264	64,499	26,152	11,701	211,807	7,903,344	7,903,344	2,106,284
1868.	3,778,871	622,677	5,910,462	811,374	764,121	255,702	30,939	5,725	232,840	95,182	10,717,233	1,790,660
1869.	1,409,603	289,202	10,986,193	2,338,777	1,010,661	360,792	7,069	969	12,019	13,425,566	2,994,404	2,994,404
1870.	3,005,916	608,415	6,573,688	1,364,062	656,726	191,146	1,000	500	165,984	73,169	10,403,314	2,237,292
1871.	2,598,007	442,914	6,291,139	1,143,922	754,365	287,732	1,000	488	225,527	97,849	13,559,038	1,971,847
1872.	5,951,795	999,064	7,403,322	1,270,145	197,339	35,568	1,700	488	38,840	15,013	18,439,407	2,307,111
1873.	4,981,872	821,449	13,418,636	2,173,588	197,339	35,568	1,700	488	38,840	15,013	18,439,407	2,307,111
1874.	4,395,953	473,020	13,367,003	1,624,697	197,339	35,568	1,700	488	38,840	15,013	18,439,407	2,307,111
1875.	3,662,247	324,116	11,055,615	1,081,814	197,339	35,568	1,700	488	38,840	15,013	18,439,407	2,307,111
1876.	8,663,564	873,592	10,675,183	1,218,916	1,178,080	127,353	3,570	88	318,392	38,432	26,819,202	2,220,268
1877.	4,262,093	558,101	21,127,100	2,988,996	1,111,617	171,200	3,570	88	318,392	38,432	26,819,202	2,220,268
1878.	4,809,278	471,871	19,347,620	1,911,694	1,111,617	171,200	3,570	88	318,392	38,432	26,819,202	2,220,268
1879.	4,687,786	377,197	17,716,883	1,517,701	1,166,825	98,292	3,570	88	318,392	38,432	26,819,202	2,220,268
1880.	2,730,147	160,549	24,034,240	1,652,200	1,166,825	98,292	3,570	88	318,392	38,432	26,819,202	2,220,268
1881.	5,326,528	351,736	34,032,428	2,661,708	1,166,825	98,292	3,570	88	318,392	38,432	26,819,202	2,220,268
1882.	6,326,586	288,581	36,326,586	2,802,955	1,166,825	98,292	3,570	88	318,392	38,432	26,819,202	2,220,268
1883.	6,959,240	460,857	45,470,118	3,433,182	1,166,825	98,292	3,570	88	318,392	38,432	26,819,202	2,220,268
1884.	5,557,310	400,833	61,622,893	4,901,448	1,166,825	98,292	3,570	88	318,392	38,432	26,819,202	2,220,268
1885.	29,542,316	2,082,561	51,494,832	3,821,162	1,166,825	98,292	3,570	88	318,392	38,432	26,819,202	2,220,268
1886.	33,452,742	2,327,844	46,548,119	3,313,491	1,166,825	98,292	3,570	88	318,392	38,432	26,819,202	2,220,268
1887.	23,862,185	2,204,847	40,162,069	2,634,894	1,166,825	98,292	3,570	88	318,392	38,432	26,819,202	2,220,268
1888.	33,908,874	2,530,308	45,517,847	3,238,053	1,166,825	98,292	3,570	88	318,392	38,432	26,819,202	2,220,268
1889.	30,440,884	1,974,204	42,089,455	3,070,941	1,166,825	98,292	3,570	88	318,392	38,432	26,819,202	2,220,268
1890.	45,039,903	2,803,070	48,962,415	3,816,964	1,166,825	98,292	3,570	88	318,392	38,432	26,819,202	2,220,268
1891.	45,307,725	2,522,317	44,547,938	3,224,736	1,166,825	98,292	3,570	88	318,392	38,432	26,819,202	2,220,268
1892.	65,898,042	2,908,987	35,380,720	2,074,140	1,166,825	98,292	3,570	88	318,392	38,432	26,819,202	2,220,268

[TABLE Z.]

CAPITAL INVESTED IN THE PRODUCTION OF CRUDE PETROLEUM, VALUE OF MATERIALS USED IN PUMPING, CARING FOR AND OPERATING WELLS, AND AVERAGE CAPITAL, PER WELL IN EACH OF THE DISTRICTS IN THE PENNSYLVANIA FIELDS IN 1889.

(Compiled from data Eleventh United States Census.)

DISTRICTS.	Total capital.	Total value of prop-erty, except land.	Total value of land.	Total acreage.	Value material operating wells.	Average capital per well.
Bradford-Allegany,	\$32,288,195	\$23,725,368	\$8,562,827	182,861	\$2,663,248	\$1,982
Forest,	1,162,174	513,836	648,338	30,895	29,900	3,887
Warren,	10,680,618	6,709,094	3,971,524	88,486	1,022,966	2,558
Butler-Clarion-Venango-Armstrong, etc.,	26,020,574	17,698,370	8,322,204	351,278	1,787,296	3,121
Allegheny,	2,070,926	1,331,050	739,876	31,971	215,096	6,949
Beaver and Smith's Ferry,	2,203,219	1,205,164	998,055	28,812	214,026	8,160
Washington,	12,238,107	9,534,291	2,703,816	112,137	2,454,446	9,933
Greene,	2,171,763	1,193,336	978,427	42,083	274,469	9,401
Franklin,	726,432	406,642	259,790	4,876	31,553	1,151
Total,	\$89,562,008	\$62,377,151	\$27,184,857	873,399	\$8,633,391	\$2,504

[TABLE AA.]

TOTAL CAPITAL INVESTED IN THE PRODUCTION OF CRUDE PETROLEUM IN THE PENNSYLVANIA FIELDS IN 1889, OTHER THAN THAT INVESTED IN LAND, COVERED BY TABLE Z.

(Compiled from data Eleventh United States Census.)

DISTRICTS.	Rigs, well engines, etc.	Tanks.	Tank cars.	Pipe lines.	Oil in stock December 31, 1889.	Other property.	Total.
Bradford-Allegany,	\$20,149,046	\$534,594	\$510	\$681,549	\$181,376	\$2,178,293	\$23,725,368
Forest,	406,569	15,911	495	42,755	7,668	40,448	513,836
Warren,	5,513,578	160,376		215,212	60,820	697,108	6,709,094
Butler-Clarion-Venango-Armstrong, etc.,	16,634,912	421,132		233,300	70,676	313,040	17,698,370
Allegheny,	1,280,455	10,900	5,250	4,771	6,857	28,067	1,331,050
Beaver and Smith's Ferry,	1,134,572	21,046			18,904	28,010	1,205,164
Washington,	9,151,407	139,590		81,819	99,054	62,421	9,534,291
Greene,	1,148,225	13,750		2,762	950	27,650	1,133,336
Franklin,	435,441	10,255	1,000	4,128		15,818	466,642
Total,	\$55,936,194	\$1,327,614	\$7,255	\$1,248,928	\$446,305	\$3,390,855	\$82,377,151

[TABLE BB.]

CLASSES OF LABOR AND WAGES PAID IN PENNSYLVANIA OIL FIELDS IN 1889, BY DISTRICTS.

(Compiled from data Eleventh United States Census.)

DISTRICTS.	FOREMEN OR OVERSEERS.		MECHANICS.		LABORERS.	
	Number.	Wages.	Number.	Wages.	Number.	Wages.
Bradford-Allegany,	432	\$244,392	3,037	\$913,488	2,709	\$873,036
Forest,	13	9,039	77	33,785	99	42,850
Warren,	120	67,276	1,256	519,476	866	260,360
Butler-Clarion-Venango-Armstrong, etc., . .	492	298,692	4,164	1,214,336	3,636	1,099,566
Allegheny,	17	12,613	155	134,386	142	61,131
Beaver and Smith's Ferry,	11	7,550	196	175,076	147	58,368
Washington,	117	85,356	894	611,697	477	254,671
Greene,	21	15,071	177	127,335	92	55,732
Franklin,	7	4,685	93	12,837	88	42,739
Total,	1,230	\$744,674	10,049	\$3,742,416	8,256	\$2,748,453

[TABLE BB.]

CLASSES OF LABOR AND WAGES PAID IN PENNSYLVANIA OIL FIELDS IN 1889, BY DISTRICTS—*Concluded.*

DISTRICTS.	BOYS UNDER SIX-TEEN YEARS.		OFFICE.				Total number of em- ployes.	Total wages paid.
			MALES.		FEMALES.			
	Number.	Wages.	Number.	Wages.	Number.	Wages.		
Bradford-Allegany,	31	\$6,587	45	\$56,479	1	\$360	6,255	\$2,094,342
Forest,			2	1,125			191	86,799
Warren,	20	6,600	24	11,032			2,286	864,744
Butler - Clarion-Venango-Arm- strong, etc.,	66	16,316	22	9,552	6	944	8,386	2,639,406
Allegheny,			4	2,125			318	210,255
Beaver and Smith's Ferry, . . .							354	240,994
Washington,	39	23,690	30	44,004			1,557	1,019,418
Greene,			6	8,800			296	206,938
Franklin,			1	624			189	60,885
Total,	156	\$53,193	134	\$133,741	7	\$1,304	19,832	\$7,423,781

[TABLE CC.]

EMPLOYMENT OF LABOR IN PENNSYLVANIA OIL FIELDS IN 1889, BY DISTRICTS.

(Compiled from data Eleventh United States Census.)

DISTRICTS.	Building rigs.	Drilling wells.	Operating and casing for wells.	Torpedoing or cleaning wells.	Building or repairing tanks.	Building or repairing pipe lines.	Office.	Total wages paid.
Bradford-Allegany.	\$120 868	\$548,558	\$1,296,607	\$44,153	\$9,286	\$18,031	\$56,839	\$2,094,342
Forest,	5,015	31,849	45,547	110	1,562	1,591	1,125	86,799
Warren,	81,048	393,668	333,848	23,248	11,830	10,070	11,032	864,744
Butler-Clarion-Venango-Armstrong,	161,908	1,097,416	1,326,976	21,230	18,406	2,974	10,496	2,639,406
Allegheny,	8,919	117,977	79,565	. . . . .	1,669	. . . . .	2,125	210,255
Beaver and Smith's Ferry,	27,696	126,409	82,989	. . . . .	3,900	. . . . .	. . . . .	240,594
Washington,	66,780	373,689	464,846	12,882	52,950	4,267	44,004	1,019,418
Greene,	3,277	75,747	101,191	3,572	10,590	3,761	8,800	206,938
Franklin,	2,703	15,482	41,570	431	75	. . . . .	624	60,885
Total,	\$478,214	\$2,780,795	\$3,773,139	\$165,626	\$110,268	\$40,694	\$135,045	\$7,423,781

[TABLE DD.]

STATISTICS OF LABOR EMPLOYED IN THE PRODUCTION OF CRUDE PETROLEUM, DURING THE YEAR ENDING MAY 31, 1880.

(From data Tenth United States Census.)

NAME OF DISTRICT.	Number of wells drilled.	Estimated number of men employed in drilling wells.	Estimated number of men employed in casing for wells.	Estimated number of skilled workmen.	Average rate of wages.	Estimated number of ordinary laborers.	Average rate of wages.	Total number of men employed.	Total amount of wages paid.
Bradford,	3,080	3,000	2,000	1,851	\$2 50-4 00	4,717	\$1 50-2 00	5,968	\$3,828,600
Lower country,	335	350	4,500	208	2 50-4 00	4,736	1 50-2 00	4,944	3,012,300
Franklin,	120	50	120	15	2 50-4 00	155	1 50-2 00	170	102,000
Beaver county,	15	10	60	12	2 50-4 00	63	1 50-2 00	75	45,000
Total,	3,550	3,410	6,780	2,086	. . . . .	9,671	. . . . .	11,157	\$6,987,900

[TABLE EE.]

CLASSIFICATION OF LABOR EMPLOYED IN THE PRODUCTION OF CRUDE PETROLEUM, BY DISTRICTS, DURING THE YEAR ENDING
DECEMBER 31, 1889.

(From data Eleventh United States Census.)

CLASS OF LABOR.	BRADFORD—ALEGANY DISTRICT.		FOREST COUNTY DISTRICT.		WARREN COUNTY DISTRICT.		BUTLER — CLARION — VENANGO DISTRICT.		ALLEGHENY COUNTY DISTRICT.	
	Number of Each Class.	Range of wages.	Number of each class.	Range of wages.	Number of each class.	Range of wages.	Number of each class.	Range of wages.	Number of each class.	Range of wages.
Foremen,	207	\$100 to \$133 per month.	9	\$50 to \$100 per month.	62	\$40 to \$100 per month.	134	\$20 to \$100 per month.	17	\$45 to \$100 per month.
Pumpers or engineers	2,209	\$5 to \$85 per month.	57	\$20 to \$60 per month.	442	\$10 to \$75 per month.	2,538	\$30 to \$85 per month.	144	\$20 to \$65 per month.
Carpenters,	687	\$2 to \$3.50 per day.	10	\$2 to \$3.50 per day.	204	\$2.50 to \$3.25 per day.	286	\$1.25 to \$3 per day.	10	\$2.50 per day.
Rig builders,	601	{ \$50 to \$100 per rig. \$2.50 to \$3 per day.	25	\$62.75 to \$125 per rig.	302	\$65 to \$200 per rig.	1,234	\$50 to \$200 per rig.	46	\$100 to \$180 per rig.
Drillers,	1,061	{ 40 cents to \$1 per foot. \$3.50 to \$4 per day.	50	40 to 60 cents per foot.	616	\$40 to \$80 per month.	2,474	35 cts. to \$1.00 per foot.	85	50 cts. to 1.15 per foot.
Tool dressers,	22	\$2.50 to \$3 per day.	5	\$3 to \$3.50 per day.	34	\$3 to \$3.50 per day.	32	\$2.50 to \$3 per day.		
Laborers,	882	\$1.25 to \$2.50 per day.	22	\$1.50 to \$2.50 per day.	444	\$1.50 to \$2 per day.	818	\$1 to \$2.50 per day.	6	\$50 to \$60 per month.
Teamsters,	52	\$30 to \$125 per month.	7	\$5 per day.	86	\$1.50 to \$5 per day.	110	\$2.50 to \$5 per day.		
Boys under 16 years,	8	\$1 to \$1.50 per day.					18	\$10 to \$20 per month.		
Well cleaners,	334	\$4 to \$6.25 per day.	2	\$5 per day.	84	\$5 per day.	274	\$2.50 to \$5 per day.	2	\$2.50 to \$3.50 per day.
Sundry mechanics,	69	{ \$50 per month. \$2.50 to \$4 per day.	1	\$60 per month.	20	\$1.70 to \$3.50 per day.	74	\$1.25 to \$4 per day.		
Totals,	6,132		188		2,294		7,992		310	

[TABLE EE.]

CLASSIFICATION OF LABOR EMPLOYED IN THE PRODUCTION OF CRUDE PETROLEUM, BY DISTRICTS, DURING THE YEAR ENDING
DECEMBER 31, 1889—*Concluded.*

(From data Eleventh United States Census.)

CLASS OF LABOR.	BEAVER COUNTY DISTRICT.		WASHINGTON COUNTY DISTRICT.		GREENE COUNTY DISTRICT.		FRANKLIN DISTRICT.		Total number of laborers.
	Number of each class.	Range of wages.	Number of each class.	Range of wages.	Number of each class.	Range of wages.	Number of each class.	Range of wages.	
Foremen.	9	\$50 to \$150 per month.	90	\$80 to \$125 per month.	921	No record.	5	\$60 to \$75 per month.	554
Pumpers or engineers.	81	\$8.33 $\frac{1}{3}$ to \$70 per month.	610	\$15 to \$60 per month.	95	do.	69	\$8 to \$57.50 per month	6,245
Carpenters.	13	\$2.50 per day.	30	\$2.50 to \$3 per day.	5	do.	15	\$1.75 to \$3 per day.	1,260
Rig builders.	42	\$110 to \$225.50 per rig.	198	\$150 to \$200 per rig.	5	do.	20	\$35 to \$80 per rig.	2,473
Drillers.	84	\$70 to \$80 per month.	588	\$1 to \$1.50 per foot.	65	do.	59	50 to 60 cents per foot.	5,082
Tool dressers. . . . .	...	.....	6	\$5 per day.	...	.....	2	\$2.50 per day.	101
Laborers.	35	\$1.39 to \$2 per day.	252	\$1.25 to \$2.50 per day.	92	do.	12	\$1.50 to \$2 per day.	2,563
Teamsters.	1	$\frac{1}{2}$ cent per gallon.	...	.....	...	.....	1	\$1.50 per day	257
Boys under 16 years. . . . .	...	.....	...	.....	...	.....	...	.....	26
Well cleaners. . . . .	...	.....	36	\$2 to \$5 per day.	5	do	...	.....	737
Sundry mechanics.	18	\$61.39 per month.	21	\$50 to \$60 per month.	2	do.	1	\$5.27 per day.	206
Totals.	283		1,831		290		184		19,504

* Estimated.

PART II.—PETROLEUM PRODUCTS.

EARLY METHODS OF MANUFACTURE.

COAL OIL.—“CRACKING.”—HUMBOLDT REFINERY.

COAL OIL.—In a few instances, petroleum has been obtained from the earth of color and odor so good that it could be burned for illuminating purposes in its natural state. Again, in a few instances, somewhat more numerous than those just mentioned, but still limited in number, oils have been found, heavy in gravity, and so free from both light ingredients and paraffine, that they are excellent lubricants in the condition in which they come from the ground. But these instances are so few that we can give it as a rule that all the uses to which petroleum is put require a manufactured article.

A study into the methods of manufacture soon shows the youth of the petroleum industry. In 1861, Gessner's *Coal, Petroleum, and Other Distillate Oils*, just published, was reviewed in the *American Journal of Science and Arts*; and, in the course of the article, the reviewer casually remarks: “It is quite possible that the future historian of the industrial arts may look back on the coal oil distillation as only an episode in the history of the development of the use of petroleum.” This was written only thirty-two years ago, the manufacture of petroleum into products being then scarcely thought of. It was lack of oil rather than means or methods for refining it that stood in the way of its use. Drake sold his crude at 75 cents per gallon, and in 1862, Isaiah Warren, who was distilling West Virginia crude in three 15-barrel stills, feared that he might produce an over-supply and break the market, which then was one dollar per gallon.

Although the industry of petroleum manufacture is not more than thirty years old, the production of mineral oil, or, as a patent granted in 1694, puts it, “pitch, tar and oyle out of a kind of stone,” dates back several centuries. This oil was made from peat or coal. The works of Messrs. Binney & Young, of Scotland, now historic because of the bitter law suits against manufacturers in this country for infringement, were erected to distill oil from bituminous or Boghead coal. This coal was imported into the United States, and a royalty of four cents per gallon (more than the total price of the manufactured article to-day), was for a time paid the Scotch inventors. But when it was found that our American coal, especially the Breckenridge, would serve that purpose quite as well, the payment of royalty was discontinued, and the suits referred

to commenced. The defeat of the Scotch claimants soon established a considerable industry in this country distilling different coals for illuminating oils.

As early as 1833, Prof. Silliman had distilled the natural petroleum, but only in an experimental way for the naphtha it contained, to be used for preserving purposes. In 1834, Samuel M. Kier, whose circular advertising his patent medicine, "American Oil," suggested to Bissell the drilling of artesian wells to find crude, started his works. A five-barrel still, furnished with oil from his father's salt wells, was sufficient to supply all demands. It is generally conceded, we believe, that this was the first refinery in America to distil the natural petroleum.

When Drake opened the way to an indefinite production of crude, there were many coal oil refineries in active operation ready to turn from the distillation of coal or shale to this cheaper and more tractable article. Two large refineries, one built on Newtown creek, almost at the site of the present Kings County Oil Works, on Long Island, by L. F. Cozzens, the West Point hotel proprietor, and the original Delmonico, and the other, the Empire Works in South Brooklyn, also on Long Island, had just begun a successful career. The projects represented by these works had to be abandoned when the existence of Pennsylvania crude became known, and the plants were sold at a great sacrifice and rearranged for the distillation of petroleum. It was in such stills as those at the works named, constructed originally for handling coal, that refined oil was first manufactured in commercial quantities. The stills were of twenty-five barrels capacity, made of cast iron, oval in shape, composed of three pieces bolted or riveted together. The parts were a cylindrical cast-iron body, a very heavy boiler-plate bottom, and a cast-iron dome-shaped top. This dome was provided with a manhole and a cast-iron gooseneck, to carry the vapors from the still over into the condenser pipe. These stills were set in thick brick-work, which extended up around their sides and over their tops, with flues so arranged that every part of the enclosed vessels was subjected to most intense heat. The cast-iron gooseneck was reduced from four feet in diameter at the still to eighteen inches at the worm, which was either a copper coil or straight cast-iron pipe of convenient lengths, immersed in a tank of water. The condenser worm was reduced from eighteen inches at the gooseneck to nine inches at the outlet. The aim in distilling was to empty the still as rapidly as possible. The quality of the products secured can be imagined; the charge being distilled to dryness, and the coke left in the still being often so hard that it had to be cut out with a chisel.

CRACKING.—The first great step forward in the art of refining was the result of an accident. Crude petroleum is made up of a great number of differently compounded hydrocarbons. The earlier methods of rapid running resulted in a simple fractional distillation, these compounds

being separated from one another as the degree of heat was increased and, beginning with the lightest, were vaporized and passed over as a vapor into the condenser coil to be there reduced to liquid form by being cooled. Such a distillation produced a series of products following one another in regular order from the lightest in gravity or density down to the heaviest, until the liquid in the still was all vaporized, and nothing was left but the dry or burnt oil on the sides and bottom. Cracking is the technical term for destructive distillation; whereby the compounds of which the crude is composed are separated not only from one another, but to a degree into their component parts, and new compounds are allowed to be formed. The result is that vapors are thrown over into the condenser worm, that liquefy into products of lighter gravity, in other words, of less density; while the heavy vapors, being condensed in the still before passing into the worm, fall back into the liquid in the still, to be again and again vaporized and decomposed.

It was by accident that it was discovered that the compound known as crude oil could, by destructive distillation, be converted into compounds of greater simplicity of construction, the lighter ones which are more valuable for the production of illuminating oils, being carried over into the condenser worm to be there liquefied, and the heavier ones left in the still to be further broken up, or reduced to liquid residuum in the still or a dry sediment or coke on its bottom.

Allen Norton Leet, in one of the articles he contributed to the *Oil, Paint and Drug Reporter*, a weekly journal published in New York, claims that the discovery was made at a little works in Newark, N. J., in the winter of 1861-62. The stillman went to his dinner one day when the still was about half empty, the distillate coming from it being 43° gravity, and everything indicating that the usual emptying of the still by the gradual production of heavier and heavier gravities would follow. He was unable to return to his work for several hours. When he did so the fire under the still was nearly out, but, to his surprise, there was running from the worm a stream of oil of light color and 48° gravity; and when, in alarm, he drew out what little fire remained under the still and allowed it to become even cooler, the gravity of the product of the worm ran up to 52°. The proprietor of the establishment then made some runs in a glass retort, and soon learned that after the great body of crude had been distilled and the lighter part driven off by heat, if the fire was reduced, the vapors were condensed in the still, only the lighter ones passing over into the worm. In those days the only product of any value was the illuminating oil, and an increase in yield of 10 per cent. or more meant a source of large revenue, even to a small works.

It was found that these lighter gravity oils from "cracking" were darker in color, making it apparent that the vapors must have been burned, a fair inference from the setting of the still surrounded by flues,

subjecting the part of the vessel above the line of liquid to almost as intense heat as the small part below it. The still was reset. Only one-third was now inclosed in brick, the upper third being covered with a thin coat of cement, and the lower third exposed to the fire. The flues that ran along the sides were fitted with dampers to cut off the heat, during the latter part of the run, from the upper portion of the still, which then acted as a condenser to drop the vapors back again into the oil below. This change increased the yield of burning oil fully 20 per cent. By means of retarding the distillation the same result in the way of destructive distillation was secured as would have been reached had the distillation taken place under pressure. The heavy vapors struck the upper part of the still, were condensed and dripped back into the oil below, which was at a higher temperature than the boiling point of the oil falling back. This produced decomposition in the oils by superheating the vapors. The discovery was soon known at all refineries, both at the seaboard and in the region, and methods of manufacture were revolutionized.

HUMBOLDT REFINERY.—On the opening up of the producing territory along Oil creek in 1860 numerous primitive small refineries appeared in an incredibly short time on the banks of that stream. This location was selected because of its proximity to the production of crude, and also because the creek served as a sewer to carry away the refuse from the works. The construction was of the rudest character, consisting of one or two cast-iron stills of a few barrels capacity, a copper worm, a tin or zinc-lined tank for treating the distillate, which was agitated by hand with a wooden paddle, and a tin-lined tank for settling the oil. Fires were frequent, often resulting in the total obliteration of the entire plant. The first two works in the state worthy of the name of refinery were the well-known Humboldt, at Plummer on Cherry run, a little stream entering into Oil creek half way between Titusville and Oil City, and Downer's works, at Corry, both built in 1862. At the former works an effort was, for the first time, made to erect a refinery that would, to some extent at least, be free from fires. At the latter a careful and, for those days, scientific study of the many problems belonging to the art of petroleum manufacture, some of which are still unsolved, was pursued. The Humboldt works were dependent for crude on the production of the neighboring territory. This became exhausted in 1866, and, as the nearest railroad source of supply was Titusville in one direction and Oil City in the other, the works were forced to stop and were soon dismantled. The Downer works could both receive their crude and ship their product by rail.

A brief description of the Humboldt refinery will be of interest. We are indebted for it in the main to Mr. Leet, who was their refiner and chemist. Twenty horizontal stills of boiler iron, with sides three-eighths inch thick and bottoms one-half inch thick, served as the nucleus for the

works. The stills were built with domes on top from which a cast-iron gooseneck carried the vapors over into the condenser of straight pipes run the whole length of a water box 300 feet long. The mouth of the worm was thus carried far enough away from the stills to prevent the uncondensed vapors from being ignited by the still fires. The condensed vapors were received in small tanks from which the naphtha could be run into a storage tank and the distillate emptied into the distillate tanks. From these it was pumped through a four-inch pipe up to the treating house. This was a five-story building with an iron tank on each floor emptying each into the tank below. The one on the first floor was connected by pipe with another building 500 feet away containing iron settling pans. Bells and speaking tubes enabled the stillman watching the distillate at the end of the long condenser to give his orders to the fireman 300 feet away. The distillate for treating was pumped up to the top one in the series of tanks in the treating house, where sulphuric acid was applied to it and the mixture agitated by means of compressed air. The sludge secured was drawn off and the distillate dropped into the next lower tank for washing with water. The water was drawn off and the distillate dropped again into a lower tank for washing with soda. This was drawn off and the distillate again dropped into the lowest tank for final washing. After this it was run into the settling tank. After settling, the oil was put into barrels furnished from a barrel factory a thousand feet away. The crude was supplied from two large tanks on the hillside overlooking the works, running into the stills by force of gravity. The fuel used was the liquid refuse, the naphtha, heavy oil and residuum made at the works. It will be seen that in many points this refinery was almost as complete as some that to-day claim to be modern.

PRESENT METHODS OF MANUFACTURE.

Refined Oil.—Crude Oil Stills.—Condensers.—Distillation of Crude.—Steam Stills.—Treatment with Chemicals and Washing.—Naphtha and Naphtha Products.—Products from Residuum.—Paraffine Wax.—Reduced Lubricating Oils.

REFINED OIL.—It is no exaggeration to say that two hundred different products are now made from crude petroleum. The limits of such a report as this will not, of course, permit even mention of each further than to outline some general classification. The broadest that can be made is to divide the products into those that result from the distillation, and those that result from the reduction of the crude article. Every product, we think it safe to say, that has been obtained from crude oil, is secured by one or the other, or in some cases, by a combination of both of these processes. By distillation we mean the converting of the crude by heat into vapors and the condensation of those vapors back to a liquid, from which the manufactured article is produced. By reduction we mean the driving out of the crude by heat its lighter portions, leaving the remaining product behind still in liquid form. Products of both classes can be, and usually are, made by the same process; that is, while heat is converting one part of the crude oil into products by distillation, that is, turning them into vapor for condensation, it is at the same time converting the other part into a product of reduction by driving off the very vapors that make the distillate products. Again; both processes are often resorted to in successive stages of manufacture, to produce certain articles. A distillate product is afterwards reduced, and a reduced product is afterwards distilled; in some instances the processes being repeated several times before the finished goods are secured. This is particularly true of the lighter and the heavier parts resulting from the method of manufacture, aiming to convert the major part of the oil under manipulation into some desired product. These lighter and heavier parts are therefore known to petroleum manufacturers as by-products. As petroleum in its crude state is composed of an almost indefinite number of differently compounded hydrocarbons, that is, combinations of the chemist's elementary substances carbon and hydrogen, varying in volatility; and as the manufactured products are almost countless in number, it will be readily understood that the methods of manufacture must be many, complicated and delicate. In the early days of the industry, but one product was sought for, and to-day the staple article of manufacture is that same product secured, however, in many grades. We refer to refined oil. But the possibility of making other valuable products was soon apparent, and each year experience and study in the art has developed almost unlimited extension of the uses of petroleum.



ECLIPSE REFINERY, FRANKLIN.

The main product of petroleum, refined oil for illuminating purposes, is always the result of distillation. At many large works to-day the crude oil, which is the base of all petroleum products, is received into storage tanks of 30,000 to 35,000 barrels capacity direct from the main trunk pipe-lines already described. Formerly crude came to the works in barrels, from which it was emptied into troughs and flowed through a sieve, to catch solid impurities, into tanks. Some of the less important refineries do not have this direct connection with the pipe-lines, and crude is brought to them in tank cars. These have an outlet valve at the bottom to which hose is connected carrying the oil into a large pipe which conveys it to the tank from which the stills are filled. When the stills are ready to be charged, powerful pumps force the crude oil through large lines into them, as it is important that time should not be wasted in this preliminary work. A careful refiner makes sure that no water is pumped with the crude into his stills; for if it is, it must also be evaporated, as well as the oil.

The production of refined oil is the result of four distinct steps.

(1.) Fractional distillation (that is, the vaporizing and condensing of the oil) in a still heated by fire. (2.) Fractional distillation in a still heated by steam. This is really a reducing process so far as the refined oil is concerned. (3.) Treating the distillates with chemicals and washing them with water. (4.) Settling to make the oil clear and bright for delivery.

CRUDE OIL STILLs.—Many different sizes of stills have been tried, from the primitive cast-iron ones of a few barrels capacity of the early days to the huge cheese-box vessels holding 3,000 and 3,500 barrels erected at several works, and many different varieties have been tested—upright cylinders, horizontal cylinders, cheeseboxes of various construction, not to mention the unsuccessful devices for effecting continuous distillation. Experience has narrowed the style of stills down to two, their competing merits being a source of much controversy among practical men. These are known as the cylinder and the cheesebox still. The former is a simple horizontal steel or wrought iron cylinder twelve and one-half feet or a little more in diameter and thirty feet or a little more in length. A cylinder of this size holds about 600 barrels of crude, and is the size generally found at the seaboard works. A circular dome about five feet in diameter and four or five feet high is set on the top of the still in the center, as an outlet for the rising vapors; a wrought-iron gooseneck fifteen inches in diameter, conducting them over to the condenser pipe, to be described later. The still rests on brick work which surrounds the lower half, the upper half being left exposed to facilitate the “cracking” or destructive distillation of the oil already explained. A double fire-box is built under the front quarter of the still, but, by having the flue for the exit of the gases of combustion in the rear, the heat is applied to the whole length of the bottom and well up on the sides of the cyl-

inder. Some of these stills have flues running along their sides, with dampers to cut off the heat at certain stages of the run. The advocates of this style of still claim for it cheapness of construction, because of its simplicity, economy in repairs, and the largest amount of work accomplished with a given quantity of fuel.

Cheesebox stills are somewhat more complicated in construction. They consist of a vertical cylinder ten feet or a little more in height and thirty feet or a little more in diameter, of five-sixteenth inch wrought-iron, with a dome-shaped top of the same material, and a five sixteenth inch steel bottom made in a double curve to provide for expansion. The center is supported on a circular pier of brickwork, which serves also for an exit for the gases of combustion through an underground flue to the chimney. From the central pier a number of brick arches are sprung to the circumference. These arches support the still and form the sides for fireboxes, of which there are varying numbers according to the design of the builder. These fireboxes are placed at equal distances from each other on the circumference of the still. A still of the size mentioned above holds about 1,200 barrels of crude. The vapors from the distilled oil pass through three pipes into a vapor chest above the top of the still, from which they are conveyed through a large number of three-inch pipes over into the condenser. The advocates of this style of construction claim for it the production of a larger yield of refined oil distillate, of lighter gravity and superior color.

Both the cylinder and the cheesebox stills are provided with man-holes, covered when the still is charged by circular plates held in place by screws and bolts. One manhole is on the top of the still and one near the bottom, on the end in the case of cylinder and side in the case of cheesebox stills. These are opened to cool the still after it has been run off, the upper one admitting men to clean and inspect it, the lower one being convenient for the men to throw out the coke or dirty sediment that has dried on the bottom and sides during the run. The stills are also provided with steam pipes of various plans, charging and draw-off pipes, gauges, vacuum and pressure valves, and many other devices that we have not space to describe.

CONDENSERS.—Originally these were copper coils, which were soon supplanted by coils of iron pipe in a tank of water. Coils of pipe are still sometimes used, but the general plan for condensers is to have straight pipe of convenient lengths laid one above another, and connected together by return bends or manifolds in a rectangular box of iron or wood. Sometimes the distillate is carried through the condenser by a number of separate pipes. In other cases all the vapor passes through one continuous pipe. The aim of the different designs is to secure the most perfect condensation of the oil vapors. Any vapor reaching the end of the condenser pipe in the form of gas is taken away to be burned for fuel. The condensed vapor is received at what is known



IMPERIAL REFINERY, OIL CITY.

as the running room, where it is watched and tested by the refiner and turned into such one of the several tanks set apart for the different products as, from time to time during the progress of the run, seems best.

DISTILLATION OF CRUDE.—As soon as the stills are filled a gentle fire is started under them, and the more volatile constituents of the crude are driven off into the condensers where they are cooled sufficiently to be liquefied, flowing as a fluid from the end of the worm. Some of the very lightest of the naphtha distillate can be condensed only at low temperatures, and then held in liquid form only under pressure. Usually this is not attempted, but the vapor is allowed to escape in gaseous form to be burned for fuel either under the stills or boilers. It is not possible to describe the distillation or “run” in other than very general details, the points of separation of products varying with different grades of crude, with the proportion of the different products desired by manufacturers at different times using the same crude, and in accordance with the ideas of the most economical method for securing the best results held by different refiners. As the fire under the still is increased in intensity the condensed vapors that appear at the mouth of the worm in what is known as the “running room” grow heavier as the run progresses, and separations or “cuts” are made by the refiner turning the stream into this or that receiving tank as his judgment directs. The points of demarkation between what is known as naphtha and as oil distillate or distillate and residuum are, as can be readily understood, purely arbitrary ones. In fact, even after the most careful separation, it is found that the heavy naphtha contains considerable of the oil distillate, and the oil distillate quite a quantity of the heavy naphtha product. Generally the distillation is fractionated into four parts—a light and a heavy naphtha and two separations in the oil distillate, leaving a residuum or tar in the still. In the running of these products the gravity or density of the condensed distillates continue to grow heavier until a point is reached where, in the judgment of the refiner, the color has become so dark that the distillate cannot be treated up to a satisfactory shade in the finished oil. Then the fires are slackened in order to allow the “cracking,” already described, to occur. By this the vapors are decomposed or split up into heavier and lighter ones, the former dropping back into the boiling oil, the latter passing over into the condenser pipe to be reduced to liquid form. During this process of “cracking” considerable quantities of uncondensable or permanent gas are produced and utilized for fuel.

From the different Pennsylvania crudes the range of products is somewhat as follows:

Naphtha, . . .	from 8 to 20 per cent.
Refined oils, . .	from 78 to 70 per cent.
Residuum, . . .	from 9 to 5 per cent.
Loss, about . . .	. 5 per cent.

The gravities of naphtha range from 90° to 62° , the gravities of refined oil distillate from 50° to 44° , the gravities of residuum from 25° to 16° .

The yields and gravities vary according to the crude run and the products to be secured. There is left on the bottom and sides of the still, after drawing out the liquid residuum, from one to one and a half per cent. of the original charge, in the form of a coke or solid deposit. This is thrown out and used as fuel. The time required to run off a still of the sizes we have described is from three to four days.

STEAM STILL.—The naphtha and oil distillates that have come from the crude stills are next put into a still worked entirely by steam. These stills are either horizontal cylinders or upright cheeseboxes holding about 1,000 barrels each. The distillation in them is effected by means of steam coils run along their bottom and top. Of the refining of crude naphtha in these stills we will speak more specifically later. Distillates for illuminating oils are subjected to a reducing, not a distilling process at this stage of manufacture. The aim is simply to drive off the inflammable gases carried over with the heavier product in fractionating the crude, in order that the distillate may be rendered safer for consumption in lamps. The heat of the steam vaporizes the more volatile gases and carries them into a condenser to be liquefied the same as distillate from a crude still. This elimination of the lighter parts from the distillate is continued until the body of the distillate in the still will stand the fire test required. By fire test is meant the temperature at which the oil will give off sufficient gas to ignite and burn.

TREATMENT WITH CHEMICALS AND WASHING.—The refined oil distillate as it comes from the crude stills is impregnated with tarry matter and inflammable gases, imparting a greenish color and an offensive odor. The gases are driven off in the steam still just described. The color and odor of the distillate after it has been steam-stilled are improved by the purifying action of chemicals and a thorough washing with water. The outline given of the method of treatment employed in early times at the Humboldt refinery, in our section describing those works, would serve almost as well for a description of the process employed to-day; except that then the distillate was moved from one tank to another for the several stages of the work, while it now remains in the same vessel throughout the treatment. This is called an agitator—a large vertical cylinder holding from one to two thousand barrels, generally lined with lead. It is built with a conical bottom to facilitate the removal of the objectionable impurities and water, as the treatment progresses. The agitator having been filled with distillate, sulphuric acid is mixed with it, and the distillate and acid are thoroughly agitated by means of an air blast introduced at the base of the conical bottom. When the air blast is shut off, the acid, completely charged with the resinous matter which it has picked up in its contact with the distillate, gradually sinks by its gravity to the bottom, from which it is readily drawn off as sludge without dis-



PHILADELPHIA REFINERY.

turbing the purified distillate above. The distillate is then treated in the same way with soda or some other alkali, to neutralize any trace of acid that may be left in it. The soda is drawn off in the same way as the acid. After these agitations, the distillate is thoroughly washed with water sprayed on its top and allowed to percolate through to the bottom; the number of washings and the manner of applying the water differing somewhat at different works; this remark is true also of the manner of applying the acid and alkali. The sludge is turned over to acid-restoring factories or to fertilizer works; the former producing fresh acid, and the latter making ammoniated phosphates from it. The treated distillate is now allowed to run down, or is pumped away, into broad shallow tanks called settling pans where it is allowed to stand for any water or other impurities that may still remain in it to slowly settle out, a steam coil at some works being used to furnish the necessary heat in cold weather to raise the temperature to the proper point to facilitate this separation. The oil is now bright, clear and clean, ready for delivery.

NAPHTHA AND NAPHTHA PRODUCTS.—We cannot help but recognize that the number and variety of petroleum products are almost limitless, when we begin to examine into the naphtha specialties. Refined oils are of many grades, from the ordinary low test oil of export to the 300° fire test oil used by certain railroads, or from the standard white or yellow oil in color to the beautiful water-white as clear and brilliant as spring water. But the varied grades are quite similar in constitution and are put to practically the same uses. With naphthas it is different. The products are unlike and the purposes served by them widely dissimilar. Naphtha as it comes from the crude stills is charged in a still quite like the steam still just described for driving out of oil distillates the more gaseous elements. In this the naphtha is distilled by steam heat, the same as refined oil distillate, except that in the case of naphtha a much larger proportion of the contents of the still is driven out in the form of vapor. The most volatile portions are seldom condensed. We refer to rhigolene, so named by Dr. Bigelow, and chymogene, which are gases at ordinary temperatures, are liquefied only at low temperatures, and are held as liquids only under pressure. They have a specific gravity of 0.625 and boil at 65° Fahr. They have been used as anæsthetics for surgical operations, really freezing the parts to which they are applied. They also serve as substitutes for ammonia in engines for artificial refrigeration, their evaporation being so rapid that a temperature of 19 degrees below zero Fahrenheit has been obtained.

The next heavier product is known as gasoline, used very generally in machines for carburetting air to make illuminating gas for dwellings and factories. This product is also employed in lamps for street lighting.

Then follows stove naphtha, used for heating and cooking in a great variety of stoves especially constructed for this purpose, a trade already of large magnitude and deservedly increasing with remarkable rapidity,

winning its own way as an economical and comfortable means of cooking during the extreme heat of our western and southern summers.

A large proportion of the yield next secured is known as gas naphtha and is delivered to gas works of cities, being now the staple article from which illuminating gas is made.

These grades, and others especially made for the purpose, are used in paints and varnishes, because of the readiness with which they evaporate, and in the manufacture of floor cloths, patent leather, etc.

Many of the naphtha products have to be treated with chemicals to deodorize them. This is done in an agitator similar to that employed for treating refined oil distillate, but care has to be exercised to avoid large losses by the evaporation of the more volatile constituents when the liquid is agitated. It was, therefore, for some time the practice to effect this agitation by some mechanical contrivance in the way of a vertical revolving shaft fitted with arms, but now an air blast is used as in the case of refined oil. Additional distillation and other manipulations are also needed to finish some of the products designed for particularly delicate uses.

PRODUCTS FROM RESIDUUM.—Naphtha is the by-product lighter than refined oil produced in its manufacture. Residuum is the corresponding heavier product. It is the residue of the crude left in the still after the vapors making naphtha and refined oil distillates have been driven out. A by-product at the refinery, it becomes a crude product, or base of manufacture, when transferred to the paraffine works. The residuum is put into stills much like those used for crude petroleum, except that they are smaller and as the fire used is much hotter and the contained liquid heavier, they are built stronger. The charge is distilled to dryness, leaving a thick layer of coke or porous carbon in the bottom, of considerable value for the manufacture of carbon points for electric light lamps, for fuel and for many other purposes.

The distillation of residuum for the manufacture of oils and waxes is an industry by itself, requiring perhaps more skill and the use of much more complicated apparatus than the production of refined oil from crude. Tar stills are often provided with a preliminary condenser in the form of cast or wrought iron eight or ten inch pipe suspended above the still or condenser box in the air, the temperature of the atmosphere being sufficient to liquefy a considerable portion of the vapors. These air condensers are provided with proper outlets to draw off the condensed oil, which, of course, is the heavier part of the vapors, the rest of the vapor passing into a condenser, similar to a refined oil condenser, immersed in water. The first part of the distillate run from tar is generally found to be sufficiently light in gravity to be sold for gas-making purposes, or to go back to the refinery to be re-run for the production of refined oil the same as crude. After this is run off, paraffine oil distillate steadily pours forth from the end of the condenser worm,



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increasing in gravity and deepening in color until the still is empty. This distillate passes through a treating process much like that employed for refined oil and naphtha, except that it is more severe as the product is so much heavier, requiring longer time, more chemicals and greater care. From this point the manipulation is in the hands of the producer of wax, as the production of the multiform paraffine lubricating oils is the result of methods used to secure the wax. The work is so distinctive and the products so unique that it seems best to consider this subject in a section by itself.

PARAFFINE WAX.—Fossil paraffine or Ozokerite or "earth wax" has been found for many centuries in enormous quantities in different parts of Europe, but particularly Galatia. It was mined the same as other mineral deposits, purified and made into candles. Peckham tells us that in 1875, there were 22,000 tons taken from the foot hills of the northern slopes of the Carpathian mountains in Galatia and certain mines of Moldavia. Its name was given it by the chemist Carl Reichenbach, who discovered in 1830, that it was the result of the distillation of several organic bodies at high temperatures. He named it paraffine because of its remarkable resistance to chemical action, the literal meaning of the word being "little, or too little, affinity." As found in the natural state in these European fields, it appears to be a mass of brown, greenish or yellow scales, which when softened can be molded like beeswax. As made from petroleum, it is in the form of a translucent crystal, of a light yellow to bluish white color, according to the grade of distillate from which it is made and the chemical treatment to which it has been subjected.

It is of interest to find that paraffine was a product of commercial importance long before petroleum oils were manufactured. Crew quotes at length from Prof. F. H. Storer's reference to patents secured by the French chemist Selligie, in 1839 and 1845. We will simply enumerate the products he described as made from bituminous shale, to show how long before the beginning of the petroleum industry, methods almost identical with those that are now so generally employed were known and tried. He used both sulphuric acid and soda for treatment and employed superheated steam in manufacture. The products of his distillation were:

1. A white, almost odorless, very limpid mineral oil that could be used for illuminating purposes in suitable lamps.

2. A light lemon-colored oil, perfectly limpid, almost odorless, that could be burned in ordinary lamps having an elevated reservoir, and, when mixed with animal or vegetable oil, did not easily congeal when subjected to cold.

3. A fat mineral oil containing a little paraffine and peculiarly adapted to lubricating machinery.

4. Red coloring matter extracted from the three oils just mentioned.

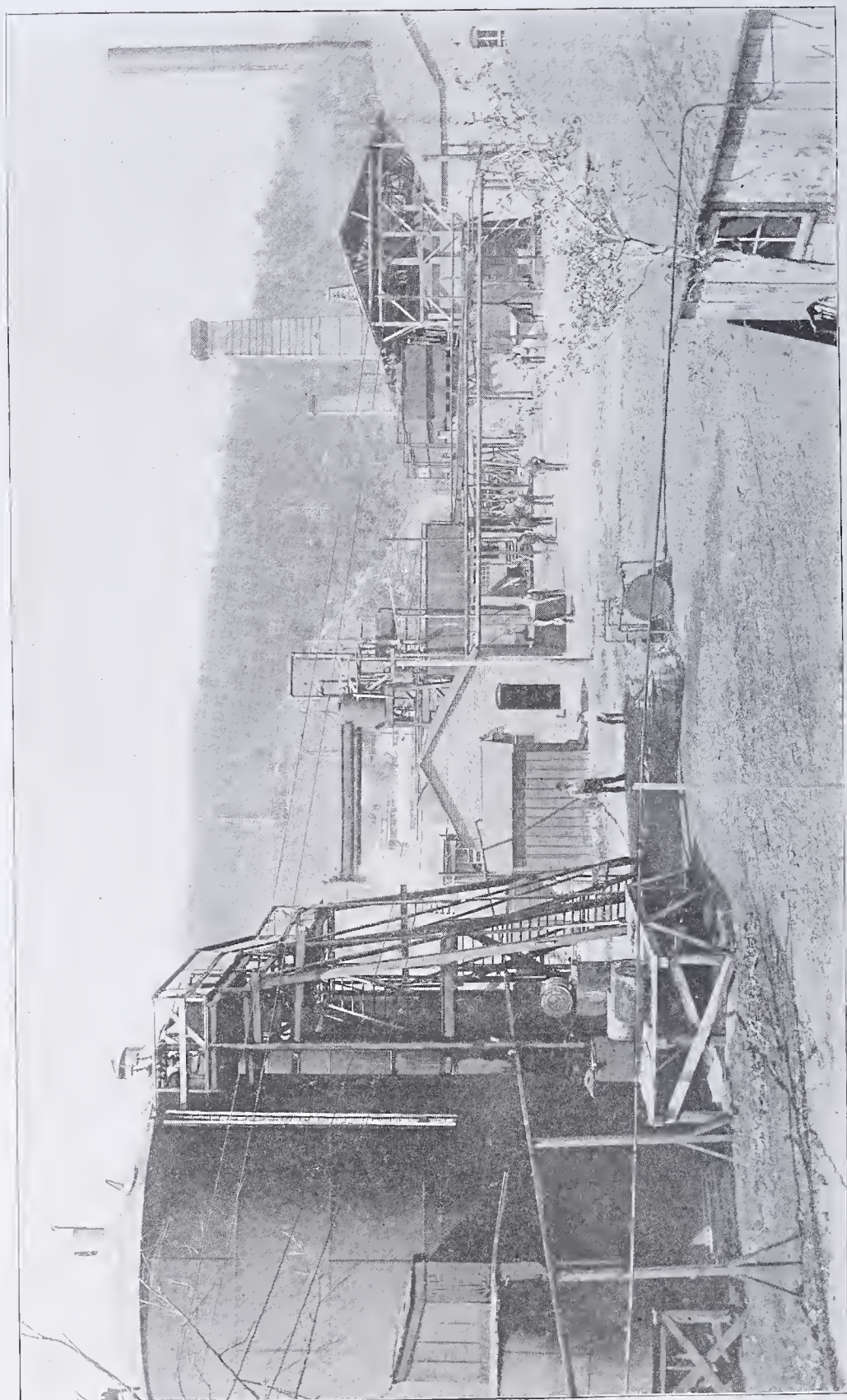
5. White crystalline paraffine, which needed but little treatment to be fit for making candles.
6. Grease for lubricating machinery.
7. Black pitch for preserving metals, woods, etc.
8. An alkaline soap.
9. Sulphate of ammonia.
10. Manure from the coke.
11. Sulphate of alumina from the coke.

It is also interesting to remember that the valuable paraffine products extracted from petroleum were not found as the result of a search for them, but in an effort to remove from paraffine lubricating oils an element that made them gum up the machinery on which they were used. Samuel Downer, in his experiments in this direction, chilled the oil until it solidified and then pressed it, the solid that was eliminated being wax.

The practice to-day is to slowly chill the heavy oil coming from the distillation of tar by means of a bath of a solution of sodic, or magnesian, chloride, brought to the required temperature by the use of an ammonia refrigerating apparatus. The semi-solid mass is then subjected to hydraulic pressure at a temperature of from 30° to 40°. The cakes remaining after pressing out the oil from the wax are then melted and the wax allowed to again crystallize, to be subjected to a much greater pressure at a higher temperature, the aim being to expel as much of the oil as possible. The absence of the wax from the expressed oil gives it what is called a good "cold test," that is, the quality of withstanding a considerable degree of cold without developing paraffine crystals to clog the machinery upon which it may be used as a lubricant. The absence of the oil from the wax makes it dry instead of greasy when put to its various uses. The temperature to which the distillate is chilled before it is pressed determines what is known as the "melting point" of the wax, that is, the temperature at which it liquefies.

For many purposes, particularly for the manufacture of the finer grades of candles, wax that has undergone even the several purifying processes already described has to be still further freed from oil. This is done by washing it with naphtha or heating it almost to the point of melting, to drain the oil out of it, and then chilling it once more after a slight chemical treatment. In this way a most beautiful, hard, colorless article is secured, which is practically pure crystalline paraffine. It is put to a large number of uses, but its greatest consumption is in the manufacture of candles, where it is gradually displacing all other materials.

REDUCED LUBRICATING OILS.—The paraffine oils just described are the result of the distillation of the residuum or reduced product left behind in the still when distilling crude petroleum. Other lubricating oils, having different characteristics from those of paraffine oils, and therefore better adapted to certain uses, are made more directly from the crude



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by a reducing process. The lighter elements in the crude are driven off, generally with great rapidity, their quality being ignored in the effort to obtain a proper residue in the still. At some works vacuum stills are employed for this purpose, that is, stills built sufficiently strong to admit of their standing a partial vacuum put upon them by the aid of a pump during the run to accelerate the withdrawal of the vapors liberated from the crude by the heat. A refinery making these reduced products is generally known as a lubricating oil works. The student of the methods at such factories finds himself in a labyrinth of processes and surrounded by multiform products. The extremes of refined oils and of waxes are touched, while between lies a wilderness of products of all kinds designed to meet the varied tastes, whims or needs of consumers. Some of the oils are mixed with the pressed distillate obtained in producing wax, some are mixed with various animal or vegetable oils, and some are purified or decolorized by filtration through animal charcoal. Each process is a separate art. To become proficient in it requires years of experience. And each process has devoted to it intricate and expensive machinery, quite beyond our limits, in such a report as this, to describe.

The advent of petroleum as a lubricant was almost as important as its advent as an illuminant. Its cheapness is reflected in the reduced costs of many lines of manufacture, where the friction of whirling machinery has to be overcome; not to mention its almost exclusive use for the lubrication of the rolling stock of railroads. Improvements in manufacture and more accurate methods of testing have removed the objections offered to the first products put on the market, namely, disagreeable odor and danger from fire, either because the oils threw off inflammable vapors or themselves ignited in spontaneous combustion when heated by friction. What requirements should be met in a satisfactory lubricating oil are admirably summarized by Prof. R. H. Thurston, of Cornell University, in his *Treatise on Friction and Lost Work in Machinery and Mill Work*:—

1. Enough body, or combined capillarity and viscosity to keep the surfaces between which it is interposed from coming into contact under maximum pressure.
2. The greatest fluidity consistent with the preceding requirements, *i. e.*, the least fluid friction allowable.
3. The lowest possible co-efficient of friction under the conditions of actual use, *i. e.*, the sum of the two components solid and fluid friction should be a minimum.
4. A maximum capacity for receiving, transmitting, storing and carrying away heat.
5. Freedom from tendency to decompose or to change in composition, by gumming or otherwise, on exposure to the air or while in use.

6. Entire absence of acid or other properties liable to produce injury of materials or metals with which they may be brought in contact.

7. A high temperature of vaporization and of decomposition and a low temperature of solidification.

8. Special adaptation to the conditions as to speed and pressure of rubbing surfaces, under which the unguent is to be used.

9. It must be free from grit and from all foreign matter.

Many grades of petroleum oil are beyond question made to-day suitable to some one of the great variety of bearings upon which they are used which meet the above requirements far better than any other lubricant.

This section would be incomplete without a passing reference to the crude oil, secured in a few places, that can be used for lubricating purposes in its natural state: the well-known Franklin oil, a first sand crude obtained in the neighborhood of the city of Franklin; the Smith's Ferry crude of Beaver county, and the natural West Virginia oil from the region about Parkersburg, in that state. These grades all come from shallow wells, and have the peculiarity of not chilling except at very low temperatures. Some of them do, however, thicken as they are cooled to the freezing point of water or below, but without depositing paraffine; it being now, we believe, a conceded fact that paraffine in crystalline form cannot be produced in crude oil by chilling but can be obtained only by first converting the crude into distillate. It is only for heavy lubrication that these natural oils are used, and in this work they are being supplanted by manufactured products which imitate their desirable qualities to a great extent—so much so, that a large proportion of the goods sold as these natural crudes are the result of skillful manufacture

EXPORT AND DOMESTIC TRADE IN PETROLEUM PRODUCTS.

Export Trade.—Barrels.—Cans and Cases.—Shipments in Bulk.—Tank Steamers and Sailing Vessels.—Tank Cars.—Tank Wagons.—New York Produce Exchange Rules Regulating Exports.—State Laws Regulating the Sale of Petroleum Products.

EXPORT TRADE.—Petroleum has undoubtedly reached a wider market than any other product of American industry. Every quarter of the globe has been blessed by its beneficent light. Wherever commerce has made its way, petroleum has been taken as an article that finds ready sale. As has been said: "It is carried wherever a wheel can roll or a camel's foot be planted. The caravans on the Desert of Sahara go laden with Astral oil and elephants in India carry cases of Standard White. Ships are constantly loading at our wharves for Japan, India, and the most distant isles of the sea." Everything connected with this magnificent business is of interest. We have seen that a silent revolution in the industry took place when pipe lines for the transportation of crude were found practicable. Another revolution has been experienced during the last five years in the mode of carrying much of the finished oil exported. Until within this period all petroleum was delivered to foreign countries in either barrels or cases. To-day the transportation of oil in bulk is becoming very general, displacing to some extent, though not altogether, shipments in barrels, and to a lesser extent, shipments in cans. The making of these packages should be briefly described.

BARRELS.—An excellent description of the manufacture, preparation and filling of barrels was given by Mr. Boverton Redwood, the official inspector of the London Petroleum Association, in his Cantor lectures before the Society of Arts, London, after a visit to America, a few years since, to familiarize himself more thoroughly with our products. When it is remembered that this outline describes the making of but one of several distinctly different kinds of packages for conveying petroleum to distant markets, that it is of course entirely separate from the manufacture of the oil, but a necessary adjunct to the success of the industry, the ramifications of the manufacture of petroleum can be comprehended. We quote the following from his lecture:—

"The oak staves are purchased ready jointed and seasoned in Michigan, and the barrel heads are brought to the works ready glued up. The first operation in barrel making consists in fitting the necessary number of staves together in a thick wrought iron ring encircling their lower ends. This is an operation requiring some experience and judgment. The embryo barrel is then placed in an iron cylinder and steamed, whereby the wood is softened. The staves are next encircled by a wire rope connected with an engine, and are thus bent into shape and drawn

together, a second strong iron hoop being slipped on their upper ends to hold them in position. The barrel is then 'fired' by burning some readily combustible material in the interior, and the curvature of the staves thus rendered permanent. A number of extra temporary iron hoops of great thickness are next slipped on, and drawn toward the bulge of the barrel by means of an ingenious arrangement of iron hooks or claws actuated by steam power. The final operation performed upon the staves consists in placing the barrel in a lathe, paring off the rough ends, and cutting the grooves for the heads.

"The barrel is then ready to receive the heads and to be hooped. The hoops weigh collectively about 12 pounds, and the total length of iron required for a set is $443\frac{1}{2}$ inches, so that putting the out-turn of finished barrels from one factory at 10,000 per day, we have a length of about 70 miles of hoop iron (weighing about $55\frac{1}{2}$ tons) used daily.

"In order to render the barrels capable of holding their fluid contents without leakage, they are coated internally with glue, about one pound of glue to three barrels being required. The glue solution is poured into the barrels hot, the barrels bunged up, and rotated so that the solution coats the entire surface, the surplus being afterwards drained out. There is some pressure of steam in the barrel during the operation, and a leak is thus at once shown. The barrels finally receive a coating of the well known blue paint on the staves, and white paint on the heads. Oil barrels returned to be refilled are often cleaned externally by an arrangement of rapidly revolving wire brushes, are steamed out, reglued and repainted.

"Before the barrels are filled, the hoops require 'driving' to take up the shrinkage of the wood. This was formerly done exclusively by hand, but Mr. Hopper has invented a successful machine for doing this by steam power. In this apparatus the barrel stands on a platform arranged like an inverted steam hammer, and on turning on the steam it is brought, with a succession of blows, against a number of hinged stops, which closely encircle the barrel and on which the hoops strike. With one such machine the hoops of 2,000 barrels can be driven in ten hours by one man and two boys—an amount of work which formerly entailed the hand labor of ten men.

"The barrels are filled from a rack provided with a series of pipes connected with a barrelling tank. Each pipe has at its exit end a float connected with a valve, which shuts off the oil when the barrel has been filled to within one gallon of its contents. The shives with which the barrels are closed are of wood and are put in with glue. A package which remains perfectly tight and free from leakage as long as it is handled carefully, and the continuous skin of glue remains intact, is thus produced."

As already stated, shipments heretofore made in barrels to many ports are now being made in bulk by both sailing vessels and steamers. These shipments and the vessels carrying them will be referred to later.

CANS AND CASES.—Shipments of oil to warm climates are made exclusively in cans, as barrels, though cheaper per gallon, are liable to develop leaks when exposed to decided changes in temperature. Deliveries to the more distant ports of China, Japan, India, Australia, the East Indies, and South America, are still, and probably will for many years continue to be, made in these packages, as bulk vessels cannot

afford to engage in that trade because no return cargoes can be secured, so that the whole expense of the round trip would have to be borne by the load of oil carried out, the steamer returning empty. Cases can be packed close together, making a solid mass, with no loss of space in a ship's hold. In this respect they have a decided advantage over barrels.

The cans are of rectangular form, holding five American (or four English imperial) gallons, and are put by twos into wooden rectangular boxes. The outside dimensions of a case are about $20\frac{3}{4}$ inches long by 15 inches high and $10\frac{1}{2}$ inches wide. This makes a very convenient package for handling, the weight of the case with the cans full of oil being about 80 pounds. The manufacture of the can and of the case are distinct industries, the former requiring delicate and expensive machinery and a large force of skilled mechanics. Most of the raw material used in making the cans, including the tin plate, is imported from England, the major part of the heavy duty imposed being returned as drawback by the government when the package of oil is exported. This is also true of the case, much of the lumber used coming from Canada, a duty being paid when it is brought into this country, and refunded on such portion of the lumber as is made up into the case and shipped abroad. Each can is fitted with a handle of wire or tin and a screw top from which the oil may be poured when the consumer wishes to use it. An oil case with its two cans is a package that reflects great credit on the skill of American inventors.

SHIPMENTS IN BULK.—A considerable portion of our domestic trade in refined oil and some portion of the trade in lubricating oils has, for many years, been done in bulk. By this we mean that no package is used for the product as it passes from the refinery to the consumer. Its course is somewhat as follows: When finished at the refinery it is pumped into large storage tanks. From these it is delivered in bulk to barges or tank cars. These carry it to the stations where it is pumped again in bulk, into tanks, from which it is delivered to tank wagons. These serve it in bulk to the dealers' tanks, to be by them delivered to the customer, or, in some cases, direct from the tank wagon to the consumer.

But this mode of transportation for export trade is of recent growth. When it was suggested that there were economies to be secured by carrying oil abroad in bulk, that all of the weight transported would be oil and freighting the package would be saved, not to mention the expense of bringing back the empty barrel to be used again, which was largely practised, as the barrels had become a burden to the foreign buyer, the contents being consumed and the packages left on his hands, numerous objections were presented. Some of them were, the great cost of providing vessels for the purpose, the small earnings on the investment because the return voyage must be made without cargo, the danger attending the enterprise from fire, and from loss of both vessel

and cargo by foundering, and the damage to the oil by changing its test or color through the extra handling. With our knowledge of what has been accomplished, we are amused to read in Prof. Peckham's report for the Tenth Census, published only eight years ago, a long quotation from the *Oil and Drug News*, referring to the plan of changing the Red Star Line steamship "Vaderland" into a bulker to carry petroleum. A part of the quotation reads:—

"Inquiry among petroleum men and shipping merchants in this city elicited the general opinion that the idea is not considered practicable. Said one well-known oil inspector: 'It is my opinion that the system will not work. It has been tried three times on sailing vessels during the past eight years, and each time the vessel was lost. * * *

* * * Besides, what is the advantage of the system, anyway? The vessel must return in ballast, and it might as well bring back barrels, which, under the present system, are used over and over again, but under the proposed method would not be needed in the export trade.'

"Messrs. ———, the well-known shipping merchants, state that about eight years ago one of their vessels was fitted up with tanks for transporting oil in bulk. She proceeded on her journey and was never heard from. Her loss was undoubtedly due to her mode of carrying petroleum. Another shipping merchant stated that he believed the idea to be impracticable. It might be possible to make the tanks strong enough to prevent the escape of the vapor of the oil, but all previous experiments had proved failures, and there was no reason to suppose that this would succeed.

* * * * *
 "The 'oil in bulk' movement does not meet with favor among practical exporters. They say that it cannot be carried out successfully."

The change in the mode of transportation when it had once begun was carried forward with startling rapidity. The "Vaderland" was not a success as a tank steamer. In 1886 two others were fitted up, the "Crusader" and the "Andromeda." The former was filled with a large number (45 in all) of cylinder tanks of different sizes, averaging in capacity 125 barrels, making the total capacity of the ship about 275,000 gallons. The "Andromeda" was provided with rectangular tanks, 72 in number, making the total capacity about 685,000 gallons. Neither of the steamers made many voyages.

But when the thought was once fairly presented, it soon became apparent that mechanical construction only stood in the way of making the change. Sailing vessels carried from 5,000 to 8,000 barrels each, and made about two and one-half to three trips per year; bulk steamers could be built to carry 20,000 to 30,000 barrels, or three times as much as a sailing vessel, and make seven to nine trips per year, or three times as many as a sailing vessel. The result has been that last year as many as fifty-nine different tank steamers carried oil from the United States abroad, and fully seventy-six percentage of the total exports of crude and refined oil, other than those in cases, were made in bulk.

Some of these steamers are "converted," that is, turned into bulk



OIL TANK STEAMER.

boats, although built for other uses. They can generally be distinguished by having their boilers and engines amidships, instead of, as in the case of the vessels built for this trade, aft, for greater safety. But many of the tank steamers are constructed especially for this service. They are models of marine architecture. They are built entirely of iron, including the decks. When loaded the whole body of the vessel is filled with oil, the ship's structure forming the necessary receptacle, the liquid occupying all the space to the "skin" or iron of the sides and bottom. This is a great improvement over such form of construction as that of the "Crusader" and the "Andromeda," already referred to, decreasing the cost of transportation by increasing the carrying capacity of the vessel, there being no unoccupied space between the tanks, and decreasing the risk of fires and explosions, as these empty spaces gave room for the accumulation of gas. Both these objections held true against the style of construction adopted later of a double bottom, the bottom of the oil tanks being elevated a short distance above the actual bottom of the ship. The tank ships as now built have a longitudinal and numerous transverse bulkheads, which, with the stringers and beams put in to prevent the slightest straining, make them, from a structural point of view, undoubtedly the safest and strongest vessels in the mercantile marine. We find a clear and comprehensive description of one of the more recently built steamers, the "Charlois," in *The Marine Transport of Petroleum*, by George Herbert Little, an English naval architect:—

" This vessel is 310 feet long, 39 feet beam, and 25 feet 3 inches deep and is capable of carrying upwards of 3,500 tons of petroleum, besides bunker coal, on a moderate draft.

" The requisite subdivision into eight tanks of moderate size is obtained by the introduction of ninthwartship bulkheads, which are very heavily stiffened and made extra thick to withstand the pressure due to any one tank being full while the others are empty. In addition to these there is a longitudinal bulkhead running the entire length of the oil compartments in the center of the ship, which further subdivides each tank into two. Wells, or water spaces, are formed at each end of the oil compartments, which are filled with water when the vessel is loaded with oil, and thereby isolate the oil from the rest of the ship and boiler room, to prevent risk of fire. Each tank is provided with a smaller tank above, running up through the 'tween-decks to the upper deck, which is fitted to allow for the expansion and contraction of the oil, due to difference in temperature, without permitting the oil to ever fall below the level of the top of the tank proper, which is essential to the vessel's stability at sea. It is usual to carry these expansion tanks about half full of oil. The expansion tanks also serve the purpose of giving access to the tanks, proper manholes and Jacob's ladders being provided. A special feature in this vessel, which the designers had particularly in view, is the fact that she could, with very slight alterations, be used for ordinary cargoes; the expansion tanks being arranged conveniently, and of extra size, for this purpose; this is, we think, an important point. The machinery and boilers are placed close aft, and

clear of the oil compartments, and the saloon and officers' and engineers' cabins and gallery, are abaft this, and therefore well clear of the tanks. The crew are berthed in the forecastle, and there is a long bridge amidships, with a shade or awning deck, connecting it to the poop. The shade deck was specially introduced by the designers to make the vessel more seaworthy, as she is employed in the Atlantic trade and this considerably reduces the amount of exposed deck. The internal fittings of this vessel are most complete, and, as a further precaution against fire, she is lighted throughout by electric light on the incandescent principle, the engines and dynamos being placed in the engine room directly under the control of the engineers. There are also steam heaters for all the cabins and the crew. Two powerful pumps are fitted in the 'tween-decks with very complete piping arrangements, each pump being capable of discharging the entire cargo of oil in thirty hours. As pointed out, there is no double bottom for water ballast, but tanks are provided at both ends for trimming purposes. For ballasting the ship when eight, two or more of the oil tanks are run up with water, special means being provided for this purpose, and when so laden the vessel is much steadier at sea than if carrying ballast in the ordinary double bottom; and, as these vessels have to make one out of every two trips across the Atlantic, light ship, this is very important."

Experience has suggested some minor improvements since the "Charlois" was built. The vessels constructed later have somewhat greater carrying capacity. The expansion tanks are not so large, but extend the whole length of the oil tanks they are designed to relieve. The strength of the hull has been still further increased by the addition of another deck or horizontal partition running through the oil tanks, dividing each into an upper and lower tank. This iron partition, with its braces, adds materially to the stability of the ship both when empty and full.

The change from barrel to bulk transportation means large economies in many ways. Before it was made, oil was filled into barrels, each package weighed by itself, then rolled to the dock front and hoisted up over the side of the ship, lowered into the hold and stowed away. Each operation required considerable manual labor. The sailing vessel, for a month or six weeks, was then exposed to the delays and vicissitudes of an ocean voyage, arriving at length at its destined port. Here she was unloaded, a barrel at a time, and the oil stored away in packages to be held until used, subject to loss from leakage and serious damage in appearance. By the new method of transportation, a steamer comes to the wharf, and the oil is pumped from the refinery storage into her tanks with great rapidity; the largest of the ships being loaded in from 10 to 12 hours even though they hold four or five times as much as the sailing vessels of a few years ago. A voyage of two weeks and perhaps a few days, the time being subject to very close calculation, brings the cargo to the foreign port. Here it is unloaded with the same despatch that was used in loading; the oil being pumped into large storage tanks on shore, in which it is held with-

out loss or damage until needed; the steamer starting immediately on her return trip. Not a moment of time is lost and no item of extra expense incurred.

TANK STEAMERS.—We append a table giving the names of the tank steamers that were engaged in carrying petroleum from the United States in 1892. There were fifty-nine in all. Those that carried cargoes from Philadelphia are designated by a star. The table shows the tonnage of each ship, her capacity to carry bulk oil, her length, breadth of beam and depth, and the flag under which she sails. A second table gives similar information in regard to the bulk sailing vessels that took cargoes last year from the United States.

[TABLE FF.]

LIST OF STEAMERS CARRYING PETROLEUM IN BULK FROM THE UNITED STATES TO FOREIGN COUNTRIES DURING THE YEAR 1892.

NAME OF STEAMER.	OIL CARRYING CAPACITY.		REGISTERED TONNAGE.		DIMENSIONS OF STEAMER. (English feet).			Flag carried.
	In gallons.	In tons.	Gross.	Net.	Length.	Beam.	Depth.	
* Allegheny,	1,200,000	3,480	2,914	1,910	320	42	26	British.
American,	1,540,000	4,450	3,897	2,927	345	44	27	Dutch.
* Apscheron,	650,000	1,800	1,864	1,441	271	37	22	Belgian.
* Aral,	1,260,000	3,655	2,826	2,160	310	40	28	British.
* Astrakhan,	1,500,000	4,350	3,438	2,236	330	42	28	do.
* Astral,	960,000	2,800	2,249	1,465	281	38	25	do.
* Bayonne,	1,400,000	4,060	3,294	2,150	330	42	28	do.
* Beacon Light, . . .	1,260,000	3,655	2,763	2,107	311	40	28	do.
* Bear Creek,	1,100,000	3,195	2,411	1,573	294	37	26	do.
* Bremerhaven, . . .	1,350,000	3,920	3,393	2,179	339	42	26	do.
* Brilliant,	1,435,000	4,165	3,162	2,411	319	42	29	German.
* Broadmayne, . . .	1,100,000	3,195	3,095	1,995	334	44	24	British.
Burgerm. Peterson, .	1,275,000	3,700	2,794	2,090	310	40	28	German.
* Cadagua,	1,020,000	2,960	2,394	1,858	305	39	26	Spanish.
* Caucase,	720,000	2,090	1,643	1,321	250	35	24	Belgian.
Charlois,	1,200,000	3,480	3,002	1,978	310	41	27	British.
* Chester,	1,175,000	3,410	2,834	1,872	311	39	25	do.
* Christine,	850,000	2,465	2,293	1,642	280	37	25	Danish.
* Circassian Prince, .	980,000	2,845	2,243	1,486	272	38	26	British.
Darial,	1,200,000	3,480	2,767	1,814	310	40	28	do.
Diamant,	1,500,000	4,350	3,525	2,270	330	43	31	German.
* Elbruz,	1,230,000	3,570	2,715	2,101	310	40	28	British.
* Elise Marie,	1,425,000	4,135	3,194	2,424	318	41	22	German.
* Energie,	1,225,000	3,555	2,765	2,074	310	40	28	do.
* Geestemunde, . . .	1,255,000	3,640	2,750	2,101	310	40	28	do.
* Glückauf,	1,025,000	2,975	2,597	1,881	300	37	30	do.
Gut Heil,	1,200,000	3,480	2,737	2,096	310	40	28	do.
* Hafis,	800,000	2,320	2,123	1,621	270	36	21	do.
* Helgoland,	1,160,000	3,195	2,397	1,563	294	37	26	do.
* Kasbeck,	1,210,000	3,510	2,707	2,099	310	40	28	British.
* La Campine, . . .	1,100,000	3,195	2,542	2,007	310	39	26	Dutch.
* La Flandre,	900,000	2,610	1,979	1,509	270	37	25	do.
La Hesbaye,	1,155,000	3,350	2,701	1,948	300	39	29	do.
* L'Oriflamme, . . .	1,120,000	3,250	2,397	1,563	343	42	28	British.

*Took cargo from Philadelphia in 1892.

[TABLE FF.]

LIST OF STEAMERS CARRYING PETROLEUM IN BULK FROM THE UNITED STATES TO FOREIGN COUNTRIES DURING THE YEAR 1892.—*Concluded.*

NAME OF STEAMER.	OIL CARRING CAPACITY.		REGISTERED TONNAGE.		DIMENSIONS OF STEAMER (English feet).			Flag Carried.
	In gallons.	In tons.	Gross.	Net.	Length.	Beam.	Depth.	
*Lucerna,	1,500,000	4,350	3,342	2,072	330	42	23	British.
*Lumen,	1,100,000	3,195	2,357	1,554	294	37	26	do.
*Manhattan,	1,400,000	4,060	3,300	2,153	330	42	21	do.
Mannheim,	1,500,000	4,350	3,507	2,257	330	43	29	German.
*Mineral,	500,000	1,450	1,304	849	249	30	23	British.
*Minister Maybach, .	1,175,000	3,410	2,486	1,955	285	40	24	German.
*Ocean,	1,170,000	3,400	2,835	1,872	310	39	25	British.
*Orange Prince, . .	845,000	2,450	*1,808	1,214	260	36	25	do.
*Oural,	950,000	2,755	2,421	1,634	270	39	21	Belgian.
*Paula,	1,190,000	3,455	2,675	2,160	285	40	30	German.
*Petriana,	600,000	1,750	1,672	1,086	260	34	21	British.
*Petrolea,	950,000	2,750	2,331	1,596	292	37	25	do.
*Phosphor,	880,000	2,555	2,023	1,326	270	37	25	do.
*Prudentia,	1,185,000	3,440	2,730	1,791	312	40	27	do.
*Robt. Dickinson, .	790,000	2,295	1,978	1,297	278	35	22	do.
*Rocklight,	1,285,000	3,730	3,225	2,119	312	40	29	do.
*Russian Prince, . .	1,200,000	3,480	2,716	2,107	310	40	28	do.
*Sophie,	625,000	1,815	1,362	1,114	235	33	23	German.
*Standard,	1,260,000	3,655	2,765	2,110	310	40	28	do.
*Tancarville,	950,000	2,750	2,336	1,541	292	37	25	British.
*Vindobala,	675,000	1,960	1,744	1,134	261	34	21	do.
*Ville de Donai, . .	720,000	2,090	1,872	1,406	265	37	23	French.
*Weehawken,	1,260,000	3,655	2,784	2,101	310	40	28	British.
*Wild Flower,	1,020,000	2,960	2,650	1,745	300	40	18	do.
Willkommen,	1,270,000	3,685	2,891	2,297	315	41	24	German.

*Took cargo from Philadelphia during 1892.

[TABLE GG.]

LIST OF SAILING VESSELS CARRYING PETROLEUM IN BULK FROM THE UNITED STATES TO FOREIGN COUNTRIES DURING THE YEAR 1892.

NAME OF VESSEL.	OIL CARRYING CAPACITY.		REGISTERED TONNAGE.		DIMENSIONS OF VESSEL (English feet).			Flag carried.
	In gallons.	In tons.	Gross.	Net.	Length.	Beam.	Depth.	
*Einar.	230,000	665	. . . . .	625	154	33	19	Norwegian.
Hainaut.	870,000	2,525	. . . . .	1,709	249	40	22	Belgian.
*Patagonia.	500,000	1,450	. . . . .	1,200	190	38	22	Norwegian.
*Rolf.	430,000	1,250	. . . . .	1,211	201	36	23	do.
*Unionen.	875,000	2,530	. . . . .	1,729	249	40	22	do.
*Ville de Dieppe.	641,000	1,860	. . . . .	1,279	217	36	21	French.

BULK BARGES.—There are several bulk steamers, smaller of course than the ocean steamers, engaged in our coastwise domestic trade. But before either the ocean or coastwise steamers were put into service, many bulk barges were employed moving refined oil and naphtha about the seaboard harbors. This mode of transportation has grown in favor, and, to-day, there is a large fleet of such barges, with their attendant steam tugs to furnish motive power, employed not only in harbors but in the carrying trade for considerable distances along the coast and up the larger rivers. The barges are of wood or iron, some large enough to hold 500,000 gallons, the whole space of the hull being divided into tanks for the oil. Simpler in construction than bulk ocean steamers, they make it possible to move large quantities of oil with dispatch and economy.

TANK CARS.—The value of this mode of transportation became apparent in the early days of the petroleum industry; but in their construction, as in other branches of the business, there has been an evolution. The first cars consisted of two wooden tubs or vats of 2,000 gallons capacity each, set on an ordinary platform car. In 1872, horizontal cylinder tanks of iron were tried. Each held about 4,000 gallons. The size has gradually been increased by lengthening the cylinder and increasing its diameter until now many of the cars carry 8,000 gallons each. Cars holding this quantity are about thirty-two feet in length and six feet in diameter. The tank is made of quarter-inch steel and has on the top a dome, similar to a still dome, to care for the expansion of the oil. In the bottom of the car is an outlet valve with proper contrivances to admit of connecting lines through which to empty the tank. The total number

* Took cargo from Philadelphia in 1892.

of tank cars employed in the United States is between nine and ten thousand.

TANK WAGONS.—The delivery of oil by tank wagons is extending the idea of bulk transportation to its farthest limits. The wisdom of carrying in this way the huge quantities, which a steamer or a train of tank cars convey for considerable distances, may be apparent; when the advantages of moving the smaller quantity which a tank wagon will hold, for the short trip it can make, may not be clear. That there must be economy or other advantages in this method of transportation is indicated by the strong foothold it has gained, as it is quite generally adopted in our larger cities and towns.

A tank wagon consists of a horizontal cylinder of steel of about three and one-half feet in diameter, and eight feet in length, mounted on four wheels similar to those used on heavy trucks. The capacity varies from 250 to 1,000 gallons; the large sizes being used in cities having paved, level streets; the smaller sizes, in the hilly outlying districts, or in sections where the trade is limited. A few of the larger wagons are rigged for three horses. Each tank has some sort of a manhole on top, for the admission of the oil; and some one of the various designs of outlet cocks and measuring devices, for drawing out the oil. These, with the receptacle for the cans for carrying the oil into stores, the driver's seat, and in fact all of the minor features of the plan of the wagons, differ in different cities. In some places the wagons leave the oil at customers' houses, but usually are employed to supply the stores in which oil is sold.

RULES REGULATING EXPORTS OF PETROLEUM.—Contracts for the sale of petroleum for export are made subject to the rules of the New York Produce Exchange. This is true of deliveries to be made from Philadelphia and Baltimore as well as from the port of New York. We append these rules as now in force.

"Refined petroleum shall be Standard White or better, with a burn-test of 110° Fahrenheit or upward, and of a specific gravity not below 44° Baumé, United States Dispensatory Standard.

"The burning test of refined petroleum shall be determined by the use of the Saybolt Electric Instrument, and shall be operated in arriving at a result as follows: In 110° and upwards, the flashing points, after the first flash (which will generally occur between 90° and 95°), shall be taken at 95°, 100°, 104°, 108°, 110°, 112° and 115°.

"In 120° and upwards, after first flash, at 100°, 105°, 110°, 115°, 118°, 120°, 122°, and 125°.

"In 130° and upwards, every five degrees until burning point is reached.

"When refined petroleum is sold in bulk, the quantity shall be ascertained by measurement on the decks of the tank boats.

"Refined petroleum shall be delivered in blue, well-painted barrels, with white heads. Barrels shall be well glued and filled within one or two inches of the bung.

"Refined petroleum in barrels shall be sold by weight, at the rate of six and one-half pounds net to the gallon.

"The tares of refined petroleum in barrels shall be weighed by half pounds and gross weight by pounds.

"The gross weight of packages for refined petroleum shall be not less than 360 lbs., nor more than 415 lbs., and the actual gross weight shall be plainly marked thereon.

"Barrels shall be made of well-seasoned white oak timber, and shall be hooped not lighter than as follows: Either with six iron hoops, the headhoop $1\frac{3}{4}$ inches wide, No. 16 gauge English standard, the quarter hoop $1\frac{1}{2}$ inches wide, No. 17 gauge, and the bilge hoop $1\frac{3}{4}$ inches wide, No. 16 gauge; or, with eight iron hoops, the head hoop $1\frac{3}{4}$ inches wide, No. 17 gauge, the collar hoop $1\frac{1}{4}$ inches wide, No. 17 gauge, the quarter hoop $1\frac{1}{2}$ inches wide, No. 18 gauge, and the bilge hoop $1\frac{1}{2}$ inches wide, No. 18 gauge. But all old barrels of which the gross weight is less than 395 lbs. may be hooped with six iron hoops $1\frac{1}{2}$ inches wide, excepting the chime hoop, which shall be $1\frac{3}{4}$ inches wide.

"Buyers may test, at their own expense, the correctness of the gross weight, or gauge of the whole, or part of any lot delivered, and the average shortage found on a portion of not less than ten per cent. shall be taken as the average amount to be deducted from the lot.

"The tare shall be plainly marked upon each barrel before it is filled. Buyers may test the accuracy of the tare so marked to the extent of five per cent. of the lot, and the average difference between the tare thus ascertained, and the marked tare on the barrels tested shall be accepted as the average difference on the entire lot. Any excess of tare so discovered shall be allowed buyer.

"**НАФТНА.**—Naphtha shall be water white and sweet, and of gravity of from 68° to 73° Baumé.

"When naphtha is sold in bulk the quantity shall be ascertained by measurement on the decks of the tank boats.

"Naphtha in barrels shall be sold by weight, at the rate of five and three-quarter pounds net to the gallon.

"Barrels containing naphtha shall be painted blue with white heads, and be well glued.

"Naphtha shall be weighed, and may be tested by the buyer, as provided in the foregoing rules relating to refined petroleum.

"**RESIDUUM.**—Residuum shall be understood to be the refuse from the distillation of crude petroleum, free from coke and water, and from any foreign impurities, and of gravity from 16° to 21° Baumé.

"Residuum, when sold in barrels, shall be sold by weight at the rate of seven and one-half pounds net per gallon.

"Residuum shall be weighed, and may be tested by the buyer, as provided in the foregoing rules relating to refined petroleum.

"**EMPTY BARRELS.**—Unless otherwise stipulated, empty barrels shall be understood to have last contained either refined petroleum or naphtha.

"Barrels shall be classified according to the use for which they are fitted, as follows:

"First class shall include all barrels, which, if properly coopered, would be fit to carry refined petroleum or naphtha.

"Second class shall include barrels which are unfit for refined petroleum or naphtha, but which would, if properly coopered, be fit for crude petroleum.

"Third class shall include such barrels as are unfit for either crude,

refined petroleum, or naphtha, but which can be used for residuum, if properly coopered.

"When barrels, which would otherwise be first class, have been injured by sand, mould or water, they shall be placed in the second class.

"When barrels are sold as they run, the term 'as they run' shall be understood to refer to the condition as to the cooperage only.

"When barrels have been filled with crude petroleum, and steamed out after shipment to Europe, and used for refined oil, such packages shall be placed in the second class.

"All empty barrels must have six hoops, and be delivered in form, shocks or staves not being a good delivery.

"On re-inspection of rejected barrels, the buyer must receive the pay for such rejections as of the class designated by the inspector, and pay inspection on such as he decides were improperly rejected.

"CONTRACTS AND DELIVERIES.—All deliveries and contracts for delivery of petroleum and its products, under these rules, shall be of the production of the United States, unless otherwise specified, but refined petroleum made from crude oil of the district known as 'Lima' or oil made from crude oil of a similar quality or character, shall be excluded.

"All settlements of contracts for refined petroleum and naphtha shall be on the following basis: In barrels on 50 gallons; in bulk on 45 gallons. All settlements of contracts for crude petroleum shall be on the following basis: in barrels on 48 gallons; in bulk on 42 gallons.

"All cooperage shall be in prime shipping order. Tar and pitch barrels shall be excluded, except for residuum.

"Deliveries of petroleum and its products, sold in bulk, shall be made in yard, at refinery, or warehouse, free of expense to lighter, quality to be approved in the tank at the time of delivery.

"Deliveries of petroleum and its products, in barrels, shall be made in yard, at refinery, or warehouse, where sea-going vessels can load, or, if not, sellers to pay lighterage to vessel.

"The words, 'yard where sea-going vessels can load,' shall be understood to mean a yard at which vessels of at least 4,500 barrels capacity can complete loading.

"The presentation of an invoice, weigher's or gauger's return, a certificate of inspection of the oil, together with an accepted order on the warehouse, yard or refinery, shall constitute a delivery.

"No weigher's or gauger's return or certificate of inspection dated more than four secular days previous to the time of delivery shall be valid, and the said returns shall be verified on oath or affirmation when required.

"Petroleum and its products shall be held for three days from noon of the date of delivery order, free of storage and insurance. The party issuing the delivery order shall keep the goods covered by insurance during the three days; it being understood, however, that the responsibility of the said party shall only extend to due care in providing insurance, and not to any failure on the part of the underwriters to pay losses which may be sustained.

"Cargo contracts shall specify dates between which the vessel shall be ready for cargo, and also number of lay days vessels will have to load, and the term 'suitable to vessel' is hereby declared to have no reference to the time when vessels shall be ready, but to imply that when ready sellers shall deliver and buyers receive in such quantities that the vessel may be loaded in the specified lay days.

"If a vessel is not ready to receive her cargo on or within specified

dates, a written notice to the buyers from the sellers on or before the latest named date that they are prepared to deliver as per contract, shall be considered a delivery, so far as maintaining to the sellers all their rights in the contract, and the sellers may commence delivering any time thereafter on one days' notice, and may deliver until completed such approximate quantity per day as would serve to fill the vessel in the stipulated lay days.

"When goods are delivered to vessel by buyer's orders the acceptance of them by buyer's inspector shall be an acknowledgment that the goods are in accordance with the contract.

"When petroleum or its products are delivered to vessel by buyer's directions, the seller's risk shall end upon delivering the goods to the ship's tackle, and the seller may require evidence from the buyer that the goods are actually covered by insurance until paid for.

"When the capacity of the vessel exceeds or falls short of the amount specified in the contract, including the margin, then the specified amount shall be delivered. In determining the capacity of the vessel, barrels of fifty net gallons capacity in case of refined petroleum and naphtha, barrels of forty-eight net gallons capacity in case of crude petroleum, and barrels of forty-five net gallons capacity in case of residuum, shall be the basis for settlement.

"On option contracts, when not otherwise stipulated, it shall be understood that ten days' notice shall be given, five of which shall be within the delivery time specified. When the term 'flat' is used, it shall be understood to mean without notice.

"All deliveries shall be made before 5 o'clock p. m. Parties making original deliveries from warehouse or refinery, shall do so before 4 o'clock p. m.

"Each party to whom delivery is made on an option contract, and who intends to deliver the same out again on an option contract, shall note on the delivery order or memorandum attached thereto the time when received, and shall deliver the same out again within fifteen minutes. Parties having oil to receive, and which they intend to deliver out again on an option contract, but who are prevented from so doing by lack of time, shall make delivery by 10 a. m. of the next business day, and each party receiving on the extended delivery day shall note the time and deliver out as above specified. No delivery shall be allowed beyond 12 m. on the delivery day so extended. Parties holding delivery orders or memorandums over fifteen minutes, except for cause acceptable to the Committee on Petroleum, shall be liable to the party injured by such unjust detention to the extent of the damage.

"Payments for all deliveries made before 3 o'clock p. m., shall be in legal tenders or certified checks. Parties making deliveries after 3 p. m. cannot demand legal tenders or certified checks; such deliveries, however, will be good if made in conformity with rule, but without delivery order. Payments which are extended by reason of delivery after 3 p. m. shall be made as provided above before 12 m. of the next business day.

"When calls are made on option contracts, the original call shall be made by 10 o'clock in the morning, and parties on whom the call is made shall note on the call the time it was received; and if they recall on account of it, they shall do so within thirty minutes.

"When contracts mature on a Sunday or legal holiday, deliveries shall be made on the preceding business day.

"Contracts for the delivery of petroleum or its products may be assigned, and the assignee shall succeed to all the rights of the assignor.

"All assignees of such contracts shall be bound by the obligations of the original contracts.

"In case any party holding a contract for petroleum or its products shall become insolvent, then all such contracts held by such party shall become due immediately, and shall be settled by the parties in interest at the market price of the day when such insolvency occurs, for the deliveries stipulated in the contracts, less the customary brokerage. All assignments of contracts made in contemplation of, or after, insolvency, shall be void.

"Nothing contained in these rules shall be constrained to prevent either of the original contracting parties from making delivery to or claiming delivery from the other party to the contract, but such delivery shall in no way otherwise invalidate the rights of any assignee of such contract. In case, however, a contract has been assigned and either of the original contracting parties shall become insolvent, the other party to the contract may, at any time before the maturity of the contract, demand a sufficient margin from the assignee to make the contract good at the market price of the day for the delivery stipulated in the contract, and the party calling the margin shall put up an equal amount. Both margins shall be deposited in such trust company as shall be agreed upon, and such margins shall be kept good. If the demand for margin under this rule be not complied with within twenty-four hours after said demand, it shall then or thereafter be at the option of the aforesaid party to the contract to cancel the same, and settlement shall be made at the market price of the day next following such demand, for the delivery stipulated in the contract, less the customary brokerage.

"INSPECTION.

"Buyers shall have the right of naming their inspector, but shall do so at least five days before the maturity of the contract, failing in which the sellers may employ, at buyer's expense, any regular petroleum inspector approved by the Committee on Petroleum, and his certificate that the oil is in conformity with the contract shall be accepted. On a contract for prompt delivery, or where no notice is required, buyers shall name their inspector when contract is executed, otherwise sellers may appoint the inspector at buyer's expense.

"It shall be the duty of the inspector to promptly inspect all goods tendered, and in case of rejection, to notify the seller immediately, to the end that he may be able to fill his contract by replacing the rejected goods.

"In case of dispute between buyer's inspector and the seller, in consequence of the rejection of goods, the seller shall have the right to name an inspector, and if the two cannot agree they shall name a third inspector as umpire, and a majority of the three shall decide the case, and render it incumbent upon the umpire to give a certificate in the regular form, without reference to the dispute. Inspectors to whom such dispute is referred shall have held uninterrupted license from the New York Produce Exchange for at least two years.

"Inspectors shall have the right to require barrels to be filled with refined petroleum at least twelve hours before the goods are tendered for inspection.

"GENERAL RULES.

The forms of contract hereto annexed are hereby made part of these rules, and when not otherwise stipulated, it will be understood that negotiations are based upon them.

"Washed or fictitious, sales are positively forbidden.

"Any disputes arising on contracts for petroleum and its products to be delivered in Philadelphia or Baltimore shall be adjusted by these rules.

"All transactions in petroleum and its products among members of the New York Produce Exchange shall be governed by the above rules, but nothing therein contained shall be construed as interfering in any way with the rights of members to make such special contracts or conditions as they may desire."

We give below the form of contract for sales of refined oil in bulk and in barrels, as showing the general form of all these contracts:

CONTRACT FOR REFINED OIL IN BULK.

NEW YORK, 18

Sold for account of M

To M

. gallons of refined petroleum in bulk, color, to be standard white, or better, burning-test 110 degrees Fahrenheit, or upward, at cents per gallon, cash on delivery. To be delivered in yard at option as to time of delivery during the

Subject to the rules of the New York Produce Exchange.

Brokerage $\frac{1}{2}$ of one per cent. by seller.

Broker.

OPTION CONTRACT FOR REFINED OIL IN BARRELS.

NEW YORK, 18

Sold for account of M

To M

. barrels per cent., more or less, refined petroleum. Color to be standard white, or better. Burning-test 110 degrees Fahrenheit, or upward, at cents per gallon, cash on delivery, in yard suitable to vessel. Vessel to be ready not earlier the of 18 . . . , nor later than the of 18, . . . , with days to load.

Subject to the rules of the New York Produce Exchange.

Brokerage $\frac{1}{2}$ of one per cent. by seller.

Broker.

It may be well to add that the 44° gravity, Baumé, United States Dispensatory standard, mentioned in these rules, corresponds to .8045 real specific gravity. Reference is also made to Standard White color. There are three grades of color recognized in export shipments—Standard White (straw color), Water White (colorless), and a shade of color intermediate between the two, called Prime White. One of the rules speaks of 110° fire test. This means an oil which does not ignite when raised to this temperature in a testing apparatus, which we will describe later, and a spark of fire, by means either of a burning splinter of wood, a burning piece of string, a little lamp or gas jet, or electricity, is applied to it. When no other test is designated in a contract 110° test is implied. But many countries have their own laws to regulate the test of the oil that can be legally used, and these laws generally prescribe the means for ascertaining the test. For example, England has fixed a minimum limit in the flash at 73° Fahrenheit, on an instrument devised by the eminent chemist, Sir Frederick Abel, with the aid of Dr. W. Kellner, assistant chemist of the English War Department. The test is to be found in the manner carefully outlined by the law, to be explained more fully in our section on modes of testing. Germany has a different test, with a minimum of flash at 21° on the Celsius scale or centigrade division of the thermometer, corresponding practically to 70° Fahrenheit, their own instrument to be used. In preparing oil for shipment to any country an effort is always made to have it comply with the legal requirements in regard to test, the oil being examined according to the mode of testing prescribed by that country.

STATE LAWS REGULATING THE SALE OF PETROLEUM PRODUCTS.—The legislatures of nearly all the states of the Union have enacted some restrictions on the manufacture and sale of oils. These show a wide divergence as regards the mode of examination and the test prescribed. It is not our intention to review this confused condition of legislation. The law in our state is that of May 15, 1874 (P. L. 189). It is, perhaps, as simple and satisfactory as any. It fixes a fire test limit of not less than 110° Fahrenheit for any illuminating product, such fire test to be ascertained on the Tagliabue cup, or the instrument that may be used by the inspectors of export oil. We append a copy of the law:—

PENNSYLVANIA STATE LAWS FOR PETROLEUM

(P. L. 189, May 15, 1874).

1. No refined petroleum, kerosene, naphtha, benzole, gasolene or any fluid, be they designated by whatsoever name, the fire-test of which shall be less than 110 degrees Fahrenheit, shall be sold or offered for sale as an illuminator for consumption, within the limits of the Commonwealth of Pennsylvania.

2. Said fire-test shall be determined by an inspector appointed under the provisions of this act, who shall use Tagliabue's or such other well-defined instrument as may be used by the inspectors of export oil, according to the following formula: Heat with alcohol small flame; when thermometer indicates ninety degrees remove lamp; at ninety-five try for a flash, with small bead of fire on end of string, held within a quarter of an inch of surface of oil; replace lamp, and work oil up gradually from this point until the burning point is reached, removing lamp every four degrees, and allowing oil to run up three degrees before replacing lamp, flashing oil each time, just before lamp is replaced, until result is attained.

3. The said inspector shall be appointed by the courts of common pleas, one in each county in the commonwealth, wherein said burning oil or fluids as before mentioned, are manufactured: *Provided*, That in any county where there shall be more than one court of common pleas, the said appointments shall be made by court No. 1, in said counties, and in any county wherein is situated a city of more than three hundred thousand inhabitants, in such case in lieu of court No. 1, the appointment of inspector shall be made by the mayor of said city.

4. The said inspectors shall hold their office for the term of three years, unless sooner removed by the appointing power, for incompetency, or found guilty under the provisions of this act; vacancies in said office to be filled by the authority in which the appointing power is vested by this section. The said inspectors shall be authorized to appoint such clerks or deputies as they may find requisite for the carrying out of the duties specified under this act; the said clerks and deputies shall be paid out of the fees of the office, by the inspector of the county wherein the service is performed; all clerks and deputies are held answerable by this act, and subject to the same penalties for violating any of its provisions as are provided in this act for the punishment of the appointed inspectors. Each inspector, deputy or clerk, after receiving his appointment, and prior to entering upon the duties of the office for which he is appointed, shall file in the office of the prothonotary of the court of common pleas, an oath or affirmation that he will well and truly perform the duties of his office and carry out the provisions of this act, and said inspectors shall also file a bond, with one or more approved securities, in style similar to that of the sheriff of the county, in the penal sum of ten thousand dollars, for the faithful performance of the duties of said inspector's office, as provided in this act. The said inspector is hereby empowered to receive and collect from the manufacturer or owner the sum of 20 cents per package for each package inspected in any lot under ten; ten cents per package for each package inspected, in any lot not more than fifty; seven cents per package for each package inspected, in

any lot or all lots over fifty; and one dollar for each car of bulk refined oil; and in case any person shall call upon said inspector to inspect one package of refined oil, he shall charge said person for each inspection fifty cents. The said inspector shall provide at his own cost, stencils for the purpose of branding packages, to read thus: "State of Pennsylvania, fire-test one hundred and ten degrees," with name of inspector: *Provided*, When oil so inspected shall stand higher test, the inspector shall designate such actual test by his brand.

5. The said inspector, or his clerks or deputies, shall and are hereby empowered to enter any place or building where oil or fluids, as before designated in this act, are manufactured, kept in store for sale or consumption, in this commonwealth, and in such counties where oil is sold and not manufactured, for which no inspector has been appointed, or in any other place within the limits of this state, wherein he has reason for believing that oil is being kept or sold contrary to the provisions of this act, or for the purpose of carrying out the true intent and meaning of this act, any inspector shall have the privilege to re-inspect, and is hereby empowered to inspect any oil, as hereinbefore designated in section first, which he may, by any reason believe to be under fire test, and if so found by him to be under fire test and falsely branded, he shall prosecute or cause to be prosecuted the offender, as herein authorized in section four of this act; no charge shall be made for re-inspection.

6. Any person violating any of the provisions of this act shall, upon conviction thereof, be deemed guilty of a misdemeanor, and shall be subject to a fine of not less than two hundred and fifty (\$250) dollars, nor more than five hundred (\$500) dollars, or imprisonment not less than one year, or both, at the discretion of the court, one half of said fine to go to the prosecutor and one half to the school fund in the district where such misdemeanor may have been committed. Also, if any person shall sustain damage to his property or injury to his person, by reason of a violation of any of the provisions of this act by another person, the person guilty of said violation shall be liable to the person injured for all damages sustained thereby.

7. All the oils or fluids subject to inspection under this act that may be found in the hands of those who sell in less quantities than one barrel, with a fraudulent brand or mark of inspection, or found to have been adulterated or not coming up to the fire test, as the mark of inspection would indicate, shall be subject to seizure by the said inspector, and the same shall, after ten days, public notice, be sold solely for redistillation, the proceeds of such sale, after deducting the necessary expenses of sale and seizure, shall one-half be given to the public school fund wherever the seizure was made, and one-half to the informer.

8. Any inspector or deputy appointed under this act, who shall violate any of its provisions, by neglecting to inspect upon request, or shall falsely brand any oil or fluid, shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be fined not less than two hundred and fifty (\$250) dollars, nor more than one thousand (\$1,000) dollars, and be subject to imprisonment for not less than three months or more than one year, or both, subject to the discretion of the court, one-half of the fine to go to the informer, and one-half to the school fund of the district wherein the offense was committed.

9. The packages containing oil manufactured for export shall be branded with a stencil by the manufacturer with the words "for export," all benzine, naphtha or any hydro-carbons, created in the manufacture

of refined oil from crude petroleum, or otherwise manufactured, shall be inspected and branded "Benzine" and shall not be kept for sale or used in any way for giving light to be burned in lamps, and this act shall not be construed to prohibit their use in making gas to be conveyed through pipes to burners similar to gas in city gas works, to be used for the same purpose, and further the penalties for violating this section shall be the same as applied to the use of refined oil below legal test.

10. Nothing contained in this act shall be construed or held to apply in any manner, to any kind of oil or fluid manufactured for export from this state, or in transit from one state to another through the limits of this commonwealth.

11. Any person or persons who shall sell or cause to be sold any barrel or package, or who shall refill the same without first removing the brand of the inspector, shall be liable to a fine of three hundred dollars for every barrel or package sold or delivered or refilled, said fines shall be recoverable as other fines of like character are recoverable by law, and one-half shall go to the informer, and one-half to the school fund of the district in which the offense was committed.

MODES OF TESTING PETROLEUM PRODUCTS.

Refined Oil.—Lubricating Oils.—Paraffine Wax.

REFINED OILS.—In addition to an inspection for color, which is a simple examination by the eye, refined oils are subjected to two tests, one to ascertain their specific gravity, and the other to determine their fire test. The lines of demarkation between oil and naphtha, the product from crude lighter than oil, on the one hand, and between oil and residuum, the product heavier than oil, on the other, is, as has been seen, a purely arbitrary one. It has also been seen that it is not practicable to make an oil absolutely free from the volatile elements of the crude called naphtha, or the heavier elements that should be left in the still as residuum. The presence of too large a proportion of the former renders the oil unsafe for illuminating purposes, as these lighter hydro-carbons vaporize at temperatures so low that the lamp may become filled with gas and an explosion follow. The presence of too large a proportion of the heavier elements injures the illuminating properties of the oil by preventing it from burning freely. The specific gravity test aims to show the density of the oil, and so to indicate, in a general way, the quantity of the heavier hydro-carbons it contains.

GRAVITY.—To make a test for gravity, a tall glass jar is filled with the oil and a combined hydrometer and thermometer is immersed in it. The hydrometer, which is graded according to the Baumé scale, registers the gravity, and the thermometer indicates the temperature of the oil. Standards for gravity require the oil to be at 60° temperature when tested, but carefully prepared tables have been made for correcting the hydrometer reading to a 60° temperature basis, so that the gravity can be ascertained quickly with the oil at temperatures both above and below 60°. We give, among our statistics on petroleum products, a table showing the corresponding real specific gravity and the weight of one gallon of oil for each degree of the Baumé hydrometer. In the absence of a table, however, Baumé can be easily converted into real specific gravity, by dividing 140 by 130, plus the degree indicated on the Baumé scale.

FLASH AND FIRE TESTS.—The test for gravity is of but little moment in comparison with that to ascertain the fire test of the oil. Upon it the public have to depend for a guarantee that the product can be used for illuminating purposes with safety. Proper methods and sufficient care should be employed in manufacture to insure, in the finished product, the absence of the more volatile hydro-carbons, which are vaporized at low temperatures, and may form an inflammable atmosphere in the oil reservoir of lamps. According to the axiom of Dr. F. H. Chandler,

of the Columbia College School of Mines, "No lamp is safe with dangerous oil and every lamp is safe with safe oil." This does not necessarily mean the establishment of a high test requirement that will be burdensome, both to the manufacturers by restricting their yield to too narrow limits, and, at the same time, to the consumers, it being a well known fact that, as the test is raised, oil proves less satisfactory as an illuminant, specially constructed lamps being required to make very high products burn at all. There is needed, simply, a test that will detect the presence of the easily volatilized elements, which unscrupulous refiners sometimes leave in their burning oil to cover up defects in manufacture. As low a fire test requirement as comes within the limit of safety, rigorously enforced, is all that is needed to accomplish this end.

While considering this topic of safety we cannot forbear to quote a paragraph from an article by Mr. Boverton Redwood, the secretary of the London Petroleum Association, and their inspector, who was the associate of Sir Frederick Abel in the most thorough investigation of the subject made in England before the adoption of the admirable law now in force. That the same conclusion has been reached by every scientific study of the question, is reassuring to the people of Pennsylvania to whom the petroleum industry is so important:—

"There are probably no grounds for supposing that petroleum oil constitutes a dangerous article in the ordinary stock of an oilman. On the contrary, there is a good deal of evidence in support of the opposite view. Thus, to take one instance only, in the case of one of the most recent fires at an oilman's shop almost the only portion of the contents of the shop which had escaped destruction were three barrels of petroleum oil, constituting, according to the evidence given, the whole stock of this material on the premises at the time of the fire. These barrels were a good deal charred, but still held a considerable quantity of oil. Petroleum is, in fact, a far less dangerous liquid than is commonly supposed, as was pointed out some years ago, and again last year, by Sir Frederick Abel in lectures at the Royal Institution. Statistics show that the destruction of petroleum-laden ships by fire is very rare, and at least one case is on record where a vessel carrying petroleum having been set on fire by lightning, the fire was extinguished, and the cargo brought safely into port. Many barrels discharged from the vessel in question bore evidence of the heat to which they had been subjected, being in some cases so much charred that a penknife blade could be driven through the staves, and yet these barrels still held the oil intact."

When oil is heated, vapors are thrown off, and, being heavier than air, they do not rise far from the surface of the oil under test. On passing a light over this surface, as the temperature of the oil is raised; there will first appear what the English Petroleum Act of 1862 describes as a "pale blue flicker or flash," caused by the vapor igniting and burning off from the surface of the oil. The temperature of the oil when this first occurs, is called its "flash test" or "flashing point." As the

temperature rises still further, a point is reached at which the oil itself takes fire on the application of a lighted taper. This is called its "burning point" or "fire test." Ignition is always preceded by a flash, but the difference in temperature between the points of flash and burning varies according to the grade of oil and its mode of manufacture. It will be clear from this description that at neither of these temperatures would the oil ignite in spontaneous combustion, as a light is required to secure even the flash referred to. Spontaneous combustion will not take place until the oil has been heated to at least 300 degrees higher than the technical "burning point" prescribed by our state law. Testers soon found that the flash and burning points were affected by the manner in which the oil was heated, by the size of the light applied to the surface, and by many other features of the test, if the details were left to the discretion of the operator. It was necessary either to outline with great minuteness every step in the test, or invent an instrument that would do the work mechanically, and, therefore, always uniformly. Modern testing cups aim to do this. The instruments have been improved, and modes of testing made more uniform. The old method of passing a burning splinter of wood or a bead of fire on the end of a string across the surface of the oil, has been supplanted by mechanical devices which carry the flame of a little lamp near to the oil, or by the use of an electric spark.

The apparatus adopted by the New York Produce Exchange is that known as the Saybolt Electric Tester, which has been in use since 1879. It is much like the Tagliabue cup; but uses an electric spark instead of a burning splinter of wood to communicate the fire to the vapor. A copper water bath, heated by a spirit lamp or gas jet, has set in its top a glass petroleum holder. A thermometer is held in place in the water bath, and another in the oil, while a clever device throws an electric spark across the surface of the oil whenever desired. The water bath is filled and heated to 100° degrees Fahrenheit, and the lamp removed. The oil cup is filled to within one-eighth of an inch of its top, and placed in the bath. When the temperature of the oil reaches 90°, an electric spark is sent across it. The lamp is then replaced under the water bath and the spark applied when the temperature of the oil is 95°, and again when it is 100°, 104°, 108°, 110°, 112°, and 115°, or until the oil flashes. The cup prescribed by our state law is the Tagliabue open cup, which is about the same as the Saybolt cup, except that a lighted taper, instead of an electric spark, is used—the objective point being that at which the oil itself ignites.

Undoubtedly the test most widely employed the world over is that of Sir Frederick Abel adopted by the English Parliament, August 11, 1879. The specifications of the apparatus as described minutely in the law are briefly as follows:

A cylindrical oil cup of gun metal or brass, tinned inside, 2 inches in diameter and 2.2 inches high, provided with a close-fitting, overlapping brass cover which carries the thermometer and test lamp, is suspended in a bath or heating vessel consisting of two flat-bottom copper cylinders—the inner one 3 inches in diameter and $2\frac{1}{2}$ inches high, the outer one $5\frac{1}{2}$ inches in diameter and $5\frac{3}{4}$ inches high—the smaller set inside of the larger, and the space between them filled with water. The oil cup, therefore, is surrounded by an air space of one-half inch, heated by a water bath; which, in turn, surrounds it. A copper cylinder or jacket, $6\frac{1}{2}$ inches in diameter, surrounds the water bath. A thermometer is provided for the water bath and another for the oil. The light for testing is furnished by a little lamp, supported on the cover of the oil cup in such a way that, as a slide is moved—uncovering a square hole in the cover of the cup—it is tilted so as to bring the flame just below the cover, returning to its original position as the slide is moved back. Near the lamp is a little bead, the dimensions of which represent the size of the test flame to be used. Where gas is to be obtained the oil lamp is to be replaced by a gas flame; but the size of the flame, is still to be regulated by the standard bead. The temperature of the water bath is brought to 130° and the lamp used for heating is withdrawn. The oil cup is then filled to within one-half inch of the top with oil at 60° temperature, and placed in position. When the oil reaches 66° the operation of testing is commenced; the test flame being applied once for every rise of one degree. This is done by slowly drawing open the slide—while a pendulum, 24 inches in length, performs three oscillations—and closing during a fourth oscillation; the movement of the slide swinging the light of the testing lamp below the cover of the oil cup, as described above.

LUBRICATING OILS.—In addition to tests for gravity, flash and burning points—which are made in ways somewhat similar to the tests applied to the refined oil—lubricating oils are subjected to two other tests; to determine their “viscosity,” and their “cold test.” By the former it is claimed that the lubricating properties of the oil can be, to a large extent, determined. It shows its viscosity or glutinous quality. The test is made by noting the length of time occupied by a given quantity of the oil in flowing through a small orifice, of prescribed dimensions and form, at a given temperature; the longer the time required the greater the viscosity.

By cold test is meant the temperature at which the oil thickens or becomes cloudy or ceases to flow because of the crystallization of the paraffine it contains. The test is usually made by slowly cooling the oil in a small tube or long bottle about $5\frac{1}{2}$ inches in length and $1\frac{1}{2}$ inches in diameter, in which a thermometer is inserted to note the temperature at which the oil no longer flows when the bottle or tube is inclined, or the temperature at which deposition of paraffine commences.

PARAFFINE WAX.—This is subjected to two tests, one to ascertain the amount of oil left in it, and the other to determine its melting point. The former test is applied by noting the loss in weight of a given quantity of wax when subjected to a specified pressure for a certain length of time. By melting point is meant the temperature at which the wax after being melted begins to solidify on cooling. A thermometer is inserted in the melted wax and used to gently agitate it until a film of the crystallizing product appears. The temperature as noted is the so-called melting point of the wax.

INVESTMENT OF CAPITAL AND EMPLOYMENT OF LABOR IN PETROLEUM MANUFACTURE.

Comparison of Records of Tenth and Eleventh United States Census.—Number of
Employees during 1889.—Wages Paid in 1889.—Tables of Statistics.

We have brought together in the tables that follow the records of the Tenth and Eleventh United States Census in regard to petroleum manufacture. We have already, under the head of petroleum production, compared these records so far as they cover the mining and storing of crude oil. We will here simply repeat that the total number of men employed in producing crude during the census year ending May 31, 1880, was 11,157, and the wages paid were \$6,987,900. The men employed during the census year ending December 31, 1889, were 19,832, and the wages paid, \$7,423,781.

The census figures on manufactures bear out the other records submitted in this report of the growth of the petroleum industry. During the year of the Tenth Census, 17,417,455 barrels (42 gallons) of crude oil were consumed. During the year of the Eleventh Census, the consumption had increased to 29,474,774 barrels (42 gallons), a gain of 70 per cent. This increase represents 506,407,384 gallons for the year, or over 40,000 barrels for each working day of the year. The magnitude of this increase can perhaps be most easily comprehended when we recollect that, up to the year 1877 (only three years before the Tenth Census), the total yearly production of crude had been much less than this gain in annual consumption during ten years. The average production of crude for 1875 and 1876 was only three-fourths of this increase in consumption and less than one-third, in fact only 30 per cent. of the total consumption for the year 1889.

The investment of capital in the industry corresponded with the growth. During the decade, the total money employed in manufacturing petroleum was almost trebled, being increased from \$27,325,746 to \$76,383,608. Unfortunately the census of 1880 did not work out the divisions of investment to the extent that the census of 1889 will do; but the items which we have of cost of buildings and of cost of machinery and tools seem to ratify the accuracy of the increase in total investment, the former showing over three times, and the latter over five times, as much in the latter as in the earlier period.

The records of the Eleventh Census on the employment of labor and wages, while not absolutely complete, are very comprehensive and, we believe, unusually accurate. The census of ten years before presented only the total number of employes engaged in manufacturing petroleum products and made no report whatever of the men employed in produc-

ing crude oil. In both these departments the Eleventh Census furnishes exhaustive records, giving the number of men carefully classified as to the branches of work done and the rates of wages received. Our tables "BB," "CC," and "EE," prepared from data of the Eleventh Census show these facts fully in reference to the production of crude. We append two tables (KK and LL) giving the record of labor employed and wages received in manufacturing the countless products of petroleum. The numbers employed in each class of work were as follows:

Superintendents,	28	Carpenters,	227
Foremen,	195	Machinists,	140
Salesmen,	23	Compounders,	4
Bookkeepers,	9	Boxmakers,	79
Clerks,	436	Filter-housemen,	17
Boys, office, etc.,	555	Barrel-housemen,	35
Stillmen,	481	Pumpmen,	69
Chief stillmen,	12	Fillers,	16
Still cleaners,	102	Inspectors,	21
Treaters,	132	Packers and shippers,	52
Coopers,	1,907	Tinsmiths,	422
Pipe-fitters,	200	Painters and gluers,	18
Laborers,	3,703	Lightermen,	25
Engineers,	114	Blacksmiths,	36
Firemen,	440	Masons,	39
Yardmen,	44	Solderers,	38
Mechanics,	271	Cap solderers,	35
Pressmen,	246	Bricklayers,	11
Boiler-makers,	302	Car builders,	75
Boilermen,	115	Faucet makers,	28
Bone burners,	15	Lead burners,	3
Teamsters,	165	Candle makers,	9
Watchmen,	126	Various helpers,	160

This shows a total of 11,180 men. To these must be added 1,356 men noted on reports not made in sufficient detail to admit of classification. This makes the total employes in manufacturing . . . 12,536
The record of men engaged in production shows 19,832

Total 32,368

Large as this number is, it does not enumerate all the labor force of the industry. A moment's reflection will suggest that it does not include men occupied in transporting the crude oil by pipe or cars, nor in moving the various products by rail, barge, sailing vessel and steamer. Nor does it embrace the large corps engaged in the many mercantile branches of the business. It would probably not be an overstatement to estimate the total employes in the petroleum industry at 50,000.

The rates of wages paid, we are inclined to think, will compare favorably with those given in any other industry of equal magnitude. Of the total 11,180 employes in manufacturing petroleum products, only 1,310, or less than 12 per cent., received below \$1.50 per day, while 4,528, or

over 40 per cent., were paid at the rate of \$2.00 per day and above. Of the 12 per cent. receiving less than \$1.50 per day, fully 5 per cent. were office boys. Returns similar to those furnished the Census Bureau, but of to-day's date, would show a considerable increase in the number of employes, and if any change in wages, they would be advances.

The following tables support the statements just made:

TABLE HH. *Quantities and values of crude petroleum consumed, and of petroleum products manufactured for the years covered by the reports of the Tenth United States Census (year ending May 31, 1880), and the Eleventh United States Census (year ending December 31, 1889).*

TABLE II. *Capital employed in the manufacture of petroleum products as shown by the Tenth and Eleventh United States Census reports.*

TABLE JJ. *Comparisons of capital invested, cost of materials, and value of products in manufacturing petroleum during the years covered by the reports of the Tenth and Eleventh United States Census.*

TABLE KK. *Classes of labor employed and wages paid in manufacturing petroleum products during the year ending December 31, 1889.*

TABLE LL. *Range of wages paid in manufacturing petroleum products during the year ending December 31, 1889.*

[TABLE HH.]

QUANTITIES AND VALUES OF CRUDE PETROLEUM CONSUMED AND OF PETROLEUM PRODUCTS MANUFACTURED, FOR THE YEARS COVERED BY THE REPORTS OF THE TENTH UNITED STATES CENSUS (YEAR ENDING MAY 31, 1880), AND THE ELEVENTH UNITED STATES CENSUS (YEAR ENDING DECEMBER 31, 1889).

	TENTH UNITED STATES CENSUS.		ELEVENTH UNITED STATES CENSUS.		INCREASE OF ELEVENTH OVER TENTH CENSUS.	
	Barrels.	Value.	Barrels.	Value.	Barrels.	Value.
Crude petroleum consumed.	17,417,455	\$16,340,581	29,474,774	\$44,267,554	12,057,319	\$27,926,973
Products:—						
Naphtha and Gasoline.	1,508,049	\$2,980,678	3,576,334	\$7,759,637	2,068,285	\$4,768,959
Illuminating oils,	11,018,793	37,042,338	17,863,861	51,031,914	6,845,068	13,989,576
Residuum,	229,133	297,529	718,106	879,052	488,973	581,523
Paraffine oils,	79,465	408,023	535,327	2,493,463	515,862	2,085,440
Reduced oils,	204,841	1,024,017	733,855	1,863,876	529,014	839,859
Neutral filtered oils,	70,415	611,572	110,165	410,729	39,750	\$200,843
Filtered cylinder oils,	26,018	371,020	242,992	1,299,798	216,974	928,778
Ointments and greases, . . . . .	.....	134,513	49,155	804,306	49,155	669,793
Paraffine wax,	31,558	631,944	183,260	2,412,396	151,702	1,780,452
Residuum products, . . . . .	.....	.....	.....	63,908	.....	63,908
All other products, . . . . .	.....	193,584	.....	5,349,372	.....	5,155,788
Total manufactured products,	13,168,272	\$43,705,218	24,073,655	\$74,368,451	10,905,383	\$30,663,233

Crude petroleum figured at 42 gallons to the barrel; petroleum products figured at 50 gallons to the barrel; paraffine wax figured at 250 pounds to the barrel. Value of products does not include packages. Values are in dollars.

* Decrease.

[TABLE II.]

CAPITAL EMPLOYED IN THE MANUFACTURE OF PETROLEUM PRODUCTS, AS SHOWN BY THE TENTH AND ELEVENTH UNITED STATES CENSUS REPORTS.

	Tenth United States Census.	Eleventh United States Census.
Investment in land.	No record.	\$7,524,626
Investment in buildings.	\$1,899,288	6,173,259
Investment in machinery, tools, etc.	3,737,998	19,338,480
Total investment in plant.	No record.	\$33,036,365
Capital, other than that invested in plant.	No record.	\$43,347,243
Total capital invested.	\$27,325,746	\$76,383,608
Number of firms and corporations.	86	105

The Tenth United States Census Report was for the year ending May 31, 1880.

The Eleventh United States Census Report was for the year ending December 31, 1889.

[TABLE JJ.]

COMPARISONS OF CAPITAL INVESTED, COST OF MATERIAL AND VALUE OF PRODUCTS IN MANUFACTURING PETROLEUM DURING THE YEARS COVERED BY THE REPORTS OF THE TENTH UNITED STATES CENSUS (YEAR ENDING MAY 31, 1880), AND THE ELEVENTH UNITED STATES CENSUS (YEAR ENDING DECEMBER 31, 1889).

	Tenth United States Census.	Eleventh United States Census.	INCREASE OF THE ELEVENTH OVER TENTH CENSUS.	
			Amounts.	Percentages.
Number of firms or corporations.	86	105	19	
Total capital invested.	\$27,325,746	\$76,383,608	\$49,057,862	179
Cost of materials:				
Crude oil.	\$16,340,581	\$44,267,554	\$27,926,973	170
Fuel.	1,319,008	1,748,600	429,592	
Sulphuric acid.	1,206,052	1,488,363	282,311	
Packages.	15,964,627	16,466,932	502,305	
All other material.	168,833	12,969,640	12,800,807	
Total cost of raw material.	\$34,999,101	\$76,941,089	\$41,941,988	120
Total value of manufactured product, including packages.	\$59,669,845	\$90,835,384	\$31,165,539	52

[TABLE KK.]
CLASSES OF LABOR EMPLOYED AND WAGES PAID IN MANUFACTURING PETROLEUM PRODUCTS DURING THE YEAR ENDING
DECEMBER 31, 1889.
(From data Eleventh United States Census.)

SUPERINTENDENTS.			FOREMEN.			SALESMEN.			BOOKKEEPERS.			CLERKS.				
No.	Rate per month.	Rate per day.	No.	Rate per day.	Rate per month.	No.	Rate per day.	Rate per month.	No.	Rate per day.	Rate per month.	No.	Rate per day.	Rate per month.	No.	Rate per month.
6	...	\$8.31	13	\$5.41	...	1	...	...	2	\$4.00	...	1	\$5.00	...	8	\$75
2	...	8.33	2	5.00	...	3	...	...	1	3.25	...	18	4.00	...	1	70
3	...	8.00	1	4.00	...	3	...	...	1	1.66	...	1	3.84	...	2	62½
2	...	7.83	7	3.75	...	12	\$125	...	3	...	...	3	3.40	...	1	60
1	...	7.00	5	3.72	...	1	100	...	1	...	...	1	3.33	...	5	50
2	...	6.00	2	3.50	...	3	83½	...	1	...	...	211	3.30	...	1	60
1	...	5.48	43	3.35	...	...	...	...	...	...	...	1	3.25	...	2	45
2	...	5.00	8	3.33	...	...	...	...	...	...	...	1	3.20	...	1	40
1	...	3.40	2	3.15	...	...	...	...	...	...	...	1	3.20	...	3	35
1	...	3.00	9	3.03	...	...	...	...	...	...	...	78	3.00	\$150	...	...
1	\$250	...	22	3.00	...	...	...	...	...	...	...	4	2.92	125	...	...
1	240	...	29	2.95	...	...	...	...	...	...	...	17	2.86	117	...	...
1	208½	...	...	2.92	...	...	...	...	...	...	...	4	2.70	110	...	...
1	166½	...	2	2.75	...	...	...	...	...	...	...	9	2.60	104½	...	...
3	66½	...	1	2.66	...	...	...	...	...	...	...	12	2.50	100	...	...
			4	2.55	...	...	...	...	...	...	...	1	2.25	85½	...	...
			2	2.55	...	...	...	...	...	...	...	8	2.12	80	...	...
Total, 28			Total, 135.			Total, 25.			Total, 9.			Total, 436.				

[TABLE KK.—Continued.]

BOYS, OFFICE ETC.				STILLMEN.				CHIEF STILLMEN.		STILL CLEANERS.		TREATERS.				COOPERS.							
No.	Rate per week.	Rate per day.	ON.	Rate per day.	ON.	Rate per month.	Rate per day.	ON.	Rate per day.	ON.	Rate per day.	Rate per month.	ON.	Rate per day.	Rate per piece.	ON.	Rate per day.	ON.	Rate per day.				
50	...	\$1 33	3	\$3 75	24	...	\$2 00	2	\$4 50	23	\$2 50	...	3	\$4 16	\$3 00	28	...	39	\$2 13				
2	...	1 25	6	3 37	26	...	1 92	3	4 33	49	2 00	...	1	4 00	2 55	11	...	89	2 00				
31	...	1 07	4	3 30	2	...	1 90	7	4 00	3	1 70	...	2	3 50	2 30	599	...	194	1 95				
4	...	1 00	14	3 00	31	...	1 75	...	...	27	1 50	...	1	3 37	1 50	151	\$1 90	5	1 87				
1	...	96	42	2 86	8	...	1 62	...	...	...	...	...	1	3 33	1 14	87	...	214	1 78				
210	...	90	4	2 85	2	...	1 60	...	...	...	...	...	1	3 30	85	6	...	30	1 75				
82	...	83	7	2 75	1	...	1 57	...	...	...	...	...	2	3 25	piece.	20	...	2	1 67				
29	...	80	1	2 67	1	...	1 50	...	...	...	...	...	...	3 20	...	32	2 75	4	1 65				
24	...	79	4	2 57	2	...	1 25	...	...	...	...	...	...	3 00	...	17	2 70	1	1 60				
57	...	75	62	2 50	2	...	1 20	...	...	...	...	...	...	2 86	...	1	2 66	1	1 57				
2	...	67	2	2 40	2	\$80	...	...	...	...	...	...	...	2 75	...	5	2 62	44	1 50				
15	...	62	8	2 37	2	75	...	...	...	...	...	...	...	2 57	...	231	2 50	2	1 33				
32	...	60	31	2 30	1	60	...	...	...	...	...	...	...	2 56	...	50	2 30	4	1 25				
10	...	58	55	2 28	...	...	...	...	...	...	...	...	...	2 50	...	9	2 28	...	...		
5	...	55	113	2 25	...	...	...	...	...	...	...	...	...	2 25	...	14	2 25	...	...		
1	\$4 00	...	21	2 17	...	...	...	...	...	...	...	...	...	2 20	...	11	2 22	...	...		

[TABLE KK—Continued.]

PIPE-FITTERS.		LABORERS.			ENGINEERS.			FIREMEN.			YARDMEN.		MECHANICS.		PRESSMEN.			BOILER-MAKERS.	
No.	Rate per day.	No.	Rate per month.	Rate per day.	No.	Rate per month.	Rate per day.	No.	Rate per month.	Rate per day.	No.	Rate per day.	No.	Rate per day.	No.	Rate per month.	Rate per day.	No.	Rate per day.
2	\$3 00	5	..	\$2 50	2	..	\$3 66	13	..	\$2 50	15	\$2 00	1	\$4 00	16	..	\$2 50	1	\$1 83
17	2 50	5	..	2 25	1	..	3 57	67	..	2 25	4	1 75	1	3 33 1/2	8	..	2 25	1	3 50
3	2 33	161	..	2 00	1	..	3 33	30	..	2 18	1	1 60	2	2 75	2	..	2 00	1	3 00
23	2 26	471	..	1 89	6	..	3 25	37	..	2 15	23	1 50	6	2 40	5	..	1 95	1	2 75
34	2 25	77	..	1 75	11	..	3 00	84	..	2 08	1	1 20	2	2 32	42	..	1 81	28	2 65
40	2 00	20	..	1 67	3	..	2 75	39	..	2 00	1	..	30	2 25	15	..	1 75	30	2 60
23	1 92	30	..	1 66	4	..	2 68	11	..	1 95	1	..	34	2 17	34	..	1 70	7	2 50
2	1 90	35	..	1 65	13	..	2 50	3	..	1 80	6	..	1	2 00	19	..	1 63	30	2 27
37	1 80	414	..	1 62	32	..	2 12	87	..	1 75	1	..	221	1 83	33	..	1 50	12	2 25
10	1 75	135	..	1 57	4	..	2 00	29	..	1 61	1	..	1	1 75	55	..	1 42	50	2 12
9	1 50	1,308	..	1 50	15	..	2 00	7	..	1 60	1	..	1	1 75	16	..	1 25	120	1 82
		45	..	1 49	11	..	1 94	1	..	1 50				..	1	\$70	..	1	1 50
		160	..	1 40	3	..	1 90	26	..	1 35				..					
		14	..	1 35	7	..	1 75	2	..	1 20				..					
		119	..	1 25	1	..	\$100	4	..	..				..
		2	..	1 17			..			..				..
		81	..	1 14			..			..				..
		7	..	1 00			..			..				..
		1	..	\$50			..			..				..
		1	..	45			..			..				..
		1	..	25			..			..				..
Total, 200.		Total, 3,703.			Total, 114.			Total, 440.			Total, 44.		Total, 271		Total, 246.			Total, 302.	

[TABLE KK—Continued.]

BOILERMEN.		BONE-BURNERS.		TEAMSTERS.			WATCHMEN.		CARPENTERS.			MACHINISTS.		COMPOUNDERS.		BOX-MAKERS.		
No.	Rate per day.	No.	Rate per day.	No.	Rate per month.	Rate per day.	No.	Rate per day.	No.	Rate per month.	Rate per day.	No.	Rate per day.	No.	Rate per day.	No.	Rate per day by box.	Rate per day.
2	\$3 00	10	\$2 50	2	....	\$4 50	1	\$2 25	3	....	\$3 00	4	\$3 50	1	\$6 00	9	....	\$3 33
6	2 50	3	1 75	1	....	4 00	28	2 00	4	....	2 75	1	3 25	1	3 75	43	....	2 50
7	2 25	2	1 60	14	....	2 25	1	2 01	64	....	2 63	3	3 00	2	2 00	10	....	2 35
15	2 12			27	....	2 08	2	1 90	3	....	2 62	8	2 81			6	....	1 50
6	2 09			10	....	2 00	5	1 89	2	....	2 58	2	2 75			3	....	1 16
13	2 02			16	....	1 88	13	1 85	34	....	2 50	19	2 73			5	\$3 25	....
39	2 00			33	....	1 80	27	1 80	22	....	2 45	4	2 62			3	....	....
21	1 75			23	....	1 76	17	1 75	25	....	2 30	58	2 50			3	by box.	....
3	1 71			20	....	1 75	1	1 66	16	....	2 25	26	2 30					....
3	1 50			3	....	1 65	3	1 64	2	....	2 17	13	2 25					....
				6	....	1 62	16	1 55	25	....	2 12	1	2 00					....
				1	....	1 60	7	1 50	24	....	2 00	1	1 75					....
				7	....	1 50	3	1 28	2	....	1 75							....
				1	....	1 25	1	1 25	1	\$60	....							....
				1	\$65	....	1	1 00			....							....
Total, 115		Total, 15.		Total, 165.			Total, 126.		Total, 227.			Total, 140		Total, 4.		Total, 79		

[TABLE LL.]

RANGE OF WAGES PAID IN MANUFACTURING PETROLEUM PRODUCTS, DURING THE YEAR ENDING DECEMBER 31, 1889.

(From data Eleventh United States Census.)

Rate per day.	No.	Rate per day.	No.	Rate per day.	No.	Rate per day.	No.	Rate per month.	No.
\$8 91.	6	2 92	6	2 20	11	1 66	34	\$250	1
8 33.	2	\$2 86	67	2 18	30	1 65	126	240	1
8 00.	3	2 85	4	2 17	24	1 64	3	208½	1
7 83.	2	2 81	8	\$2 15	39	1 62	444	166½	1
7 00.	1	2 75	61	2 13	39	\$1 61	7	150	3
6 00.	3	2 73	19	2 12	137	1 60	23	125	14
5 48.	1	2 70	21	2 10	29	1 57	137	117	1
5 41.	13	2 68	4	2 09	6	1 55	16	110	4
5 00.	5	2 67	1	2 08	111	1 50	2,120	108½	3
4 67.	3	2 66	144	2 05	3	1 49	46	104½	4
4 50.	4	2 65	28	2 03	23	1 42	55	100	10
4 33.	3	2 63	64	2 02	13	1 40	160	90	1
4 17.	2	2 62	15	2 01	1	1 35	124	83½	15
4 16.	1	2 60	39	2 00	605	1 33	52	80	4
4 00.	34	2 58	2	1 95	210	1 28	3	75	6
3 84.	1	2 57	5	1 94	27	1 25	175	70	2
3 83.	1	2 56	22	1 92	49	1 20	8	66½	3
3 75.	11	2 55	13	1 90	161	1 17	2	62½	2
3 72.	5	2 54	10	1 89	476	1 16	3	60	6
3 66.	2	2 53	7	1 88	43	1 14	168	55	1
3 57.	1	2 50	738	1 87	50	1 07	31	50	8
3 50.	12	2 45	22	1 85	14	1 00	14	45	9
3 40.	4	2 40	8	1 83	236	96	1	40	1
3 37.	8	2 37	18	1 82	120	90	210	35	3
3 35.	43	2 35	10	1 81	42	85	6	25	1
3 33.	29	2 33	6	1 80	185	83	82		
3 30.	220	2 32	2	1 78	214	80	29		
3 25.	32	2 50	749	1 77	22	79	24		
3 20.	2	2 29	7	1 76	23	75	57		
3 15.	2	2 28	64	1 75	459	67	3		
3 12.	9	2 27	50	1 71	3	62	15		
3 03.	9	2 26	23	1 70	38	60	32		
3 00.	194	2 25	398	1 69	19	58	10		
2 95.	29	2 22	11	1 67	22	55	5		

Total number paid by the day, 11,052

Total number paid by the month, 105

Total number paid by the piece, 23

Classified total, 11,180

Unclassified, 1, 56

Total employes manufacturing petroleum, 12,536

STATISTICS OF EXPORTS OF PETROLEUM PRODUCTS.

It seems almost incredible that the exports of petroleum products which, as the accompanying tables show, have now attained such enormous proportions, could have begun only thirty years ago. Messrs. Lockhart & Company, of Pittsburgh, have been generally considered the pioneers in the export business, having the distinction of sending the first American oil abroad, some 400,000 gallons, in 1862. But Mr. Allen Norton Leet, in one of his articles contributed to the *Oil, Paint and Drug Reporter*, claims that James Day sent 1,000 gallons of refined oil to Australia in 1859; and that Col. E. C. Ferris, in the same year, made shipments to South America, Germany and Italy. However this may be, there were no exports worthy of the name before 1863 or 1864; so that we are not making an overstatement in saying that the export trade in petroleum has reached its present proportions in the short space of thirty years.

For the tables that follow, we wish to acknowledge our indebtedness to the very admirable and complete records of the Bureau of Statistics of the United States Treasury Department. If their information on other exports are as accurate as that on petroleum, the work of this bureau cannot be too highly praised. We are also greatly indebted to the private records of the various branches of the Standard Oil Company; those giving the market quotations on export oils having been kindly placed at our disposal. We have been helped also by the records of the New York Produce Exchange.

TABLE MM. *Exports of petroleum, showing the quantities and values of the different grades exported, and the countries to which they were sent, for the year ending June 30, 1890.*

TABLE NN. *Exports of petroleum, showing the quantities and values of the different grades exported, and the countries to which they were sent, for the year ending June 30, 1891.*

TABLE OO. *Exports of petroleum, showing the quantities and values of the different grades exported, and the countries to which they were sent, for the year ending June 30, 1892.*

Had the limits of this report permitted, we would have carried these tables back and given these exports for earlier years also.

TABLE PP. *Exports of illuminating oils, showing quantities, values and countries to which sent, from July 1, 1863, to June 30, 1892.*

By reference to table QQ, it will be seen that the exports of illuminating oils for the year ending June 30, 1890, were 523,29 ,090 gallons, valued at \$38,640,638; for June 30, 1891, they were 571,119,805 gallons, valued at \$40,221,201; and for June 30, 1892, 564,896,658 gallons, valued at \$33,541,224. It will be noted that the year 1891 shows the largest quantity of illuminating oil exported, namely, 571,119,805 gallons; and that the year 1886 shows the largest value, namely, \$40,634,331.

and that the year 1886 shows the greatest value; namely, \$40,634,331.

The exports of illuminating oils were in 1866, three times those of 1864; those of 1868 were twice those of 1866, and six times those of 1864; those of 1871 were twice those of 1868, and twelve times those of 1864; those of 1877 were twice those of 1871, and twenty-four times those of 1864; those of 1891 were twice those of 1877, and forty-eight times those of 1864. In other words the exports of refined oils doubled themselves, beginning with 1866, in 1868; again in 1871; again in 1877; and again in 1891: so that those of 1891 were twice those of 1877, eight times those of 1868, sixteen times those of 1866, and forty-eight times those of 1864. Or to put it in another way, the average exports for every week of the year 1892 equalled the total exports for the whole year of 1864.

TABLE QQ. *Exports of illuminating oil by countries, showing percentage of total value sent to each country named, from July 1, 1863, to June 30, 1892.*

This table shows the relative value of the petroleum exports from America to the different geographical divisions of the globe. It is of interest to note the proportions of the shipments that went to each.

TABLE RR. *The petroleum exports by grades and shipping ports, from July 1, 1863, to June 30, 1892.*

This shows the quantity and value of each grade of petroleum exported—crude, refined oil, naphtha, lubricating oil and residuum—each year, from each of the principal delivery ports. We note with interest the growth of the shipments from Philadelphia. In 1864, they were twenty-one per cent. of the total from the whole United States. The percentage had increased to forty-three per cent. in 1866. By 1874, although the Philadelphia exports were seventeen times those of 1864, the percentage of the total was only thirty-five per cent. By 1882, although the Philadelphia exports were twenty-five times those of 1864, the percentage of the total was only twenty-two per cent. By 1891, although the Philadelphia exports were thirty-eight times those of 1864, the percentage was only twenty-seven per cent. By 1892, the Philadelphia exports had grown to forty-seven times those of 1864, and to thirty-two per cent. of the total from all ports.

TABLE SS. *Petroleum exports by grades, from July 1, 1863, to June 30, 1892.*

This table—better, perhaps, than any other except our table B which shows the same facts graphically to the eye—shows the phenomenal growth of the petroleum industry, particularly in the line of exports. In this connection we would call attention to the fact that a larger percentage of the oil product of the country is exported than that of any other product except cotton. The exports were 23,000,000 gallons, in 1864. By 1869 they had grown to 100,000,000 gallons; by 1874, they had grown to 200,000,000 gallons; by 1877, to 300,000,000

gallons; by 1880, to 400,000,000 gallons; by 1882, to 500,000,000 gallons; by 1889, to 600,000,000 gallons; by 1891, to 700,000,000 gallons.

TABLE TT.—*Petroleum exports from Philadelphia, showing quantities and values of each grade from July 1, 1863, to June 30, 1892.*

The exports from Philadelphia have increased from less than 5,000,000 gallons, valued at \$2,000,000, in 1864, to over 231,000,000 gallons, valued at over \$11,800,000, in 1892. From 1864 to 1874 there was a steady growth from 5,000,000 up to 88,000,000 gallons. Then came a decline, until, in 1878, the exports were less than 48,000,000 gallons. 1882 shows nearly 125,000,000 gallons; 1887, over 156,000,000 gallons. 1888 and 1889 were smaller years, but 1890 shows a total of over 163,000,000 gallons; 1891, of over 190,000,000 gallons; while 1892 presents the largest exports on record—231,111,409 gallons, valued at \$11,803,312.

TABLE UU.—*Exports of paraffine and paraffine wax, from July 1, 1880, to June 30, 1892.*

Trade in this product is of much more recent growth than in petroleum oils. Our table shows a similar increase. In 1881 the exports amounted to 5,369,821 pounds, valued at \$437,187; those for 1891, to 66,366,003 pounds, valued at \$3,714,649—that is, an increase of over 1200 per cent. for the 10 years.

TABLE VV.—*Average monthly and yearly export prices of crude oil, per gallon, in barrels, at New York.*

TABLE WW.—*Average monthly and yearly export prices of naphtha, per gallon, in barrels, at New York.*

TABLE XX.—*Average monthly and yearly export prices of refined oil, per gallon, in barrels, at New York.*

It seems fair to conclude from these tables that the reduction in prices has materially aided the natural value of petroleum products in the substantial increase in exports, shown by the preceding tables. The average price for refined oil for export for 1861 was $61\frac{1}{2}$ cents per gallon; for 1871, $23\frac{3}{8}$ cents; for 1881, 8 cents; for 1891, $6\frac{7}{8}$ cents; for 1892, 6 cents, or less than one-tenth that for 1861. But this decrease, large as it is, does not really represent the reduction in the price of the oil, as the figures given represent oil in barrels, and so include the cost of the package. The average price of the oil for 1861, deducting the barrel, would be not less than 58 cents; and for 1892, not more than $3\frac{1}{2}$ cents, or hardly one-seventeenth that of 31 years ago. In January, 1861, the price of a gallon of oil in bulk was 75 cents; in January, 1893, it was 3 cents, or, say one-twenty-fifth. This difference on a barrel of 50 gallons amounts to \$36. The money that in 1861 was required to buy 1,000 barrels of oil will to-day purchase a bulk steamer load of 25,000 barrels, or 1,250,000 gallons.

TABLE YY.—*Table to show the corresponding real specific gravity and the weight of one gallon of refined oil at 60 degrees temperature for each degree of the Baumé scale.*

The Baumé reading can be readily converted into real specific gravity by dividing 140 by the sum of 130 and the degree shown on the Baumé scale. Real specific gravity can be converted into Baumé by subtracting 130 from the result of a division of 140 by the degree of specific gravity shown.

[TABLE MM.]

EXPORTS OF PETROLEUM, SHOWING THE QUANTITIES AND VALUES OF THE GRADES EXPORTED AND THE COUNTRIES TO WHICH THEY WERE SENT, FOR THE YEAR ENDING JUNE 30, 1890.

(Compiled from data United States Treasury Department.)

	CRUDE OIL.		NAPHTHA.		REFINED OIL.		LUBRICATING OIL.		RESIDUUM.	
	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Barrels.	Dollars.
Argentine Republic,			47,020	9,508	3,113,750	339,070	300,490	93,252		
Austria-Hungary.	3,297,291	212,684					40,243	11,104		
Belgium.			303,520	26,300	41,391,323	2,221,947	1,955,145	249,926		
Brazil.			24,419	4,135	8,635,291	876,641	128,301	49,031	10	55
Central America (Nicaragua).			946	122	258,899	31,261	6,066	1,829	16	69
Chile,			2,045	593	2,979,924	306,945	186,004	73,063		
China.	532,250	49,499			13,072,000	1,251,201	2,669	1,888		
Colombia,			16	7	554,483	70,694	17,970	6,702	678	3,066
Denmark,					7,147,115	496,243	43,598	8,120		
Ecuador.					185,285	22,746	13,233	2,649		
France,	68,947,436	4,491,120	4,195,704	364,477	2,088,291	155,270	3,088,183	454,205		
French West Indies,					437,849	44,080	1,500	754	10	42
French East Indies,					1,012,520	92,625	250	250		
French possessions in Africa and adjacent islands,			4,750	618	1,432,240	123,670				
Germany,	1,188,266	59,259	2,015,298	159,834	140,264,089	7,706,452	3,670,937	566,495	22	53
England,	255	22	5,532,365	488,298	60,960,345	4,136,841	14,886,635	2,233,113	4,552	17,464
Scotland,	2,900	325			325,457	25,342	2,070,692	348,049		

[TABLE MM]—Continued.

	CRUDE OIL.		NAPHTHA.		REFINED OIL.		LUBRICATING OIL.		RESIDUUM.	
	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Barrels.	Dollars.
Ireland,			71,629	6,449	5,107,444	387,737	78,120	8,382		
Gibraltar,	191,350	18,561			804,000	74,502	3,500	763		
Nova Scotia, New Brunswick and Pr. Edward's Is.,			2,406	265	2,198,385	222,608	163,444	33,002	27	113
Quebec, Ontario, Manitoba and N. W. Ter.,	22,040	2,403	31,424	4,726	2,128,453	197,229	81,009	22,608		
British Columbia,	14,235	3,200	2,405	447	278,224	51,786	12,330	3,423		
Newfoundland and Labrador,					499,802	42,781	15,556	5,195	10	37
British West Indies,	101	10	8,100	1,860	1,933,096	204,508	12,911	4,722	65	229
British Guiana,					1,134,212	112,096	6,485	2,506		
British East Indies,					44,023,425	4,070,875	9,840	6,140		
Hong Kong,					11,150,220	1,137,255				
British possessions in Africa and adjacent islands,			6,114	1,968	3,870,732	453,262	14,155	4,122		
British possessions in Australia,			45,161	11,202	7,976,572	970,768	378,005	77,022		
Greece,					1,756,780	167,117				
Hawalian Islands,					752,900	94,653	14,350	5,447	4	18
Hayti,					202,646	30,659	3,452	1,538	86	365
Italy,			400	80	19,747,751	1,642,830	510,622	68,553	5,443	12,580
Japan,			53	18	37,892,930	3,559,375	51,991	14,405		
Mexico,	2,217,846	193,320	9,120	1,586	1,754,748	197,648	125,505	34,826	64	375
Netherlands,					47,315,526	2,537,324	2,037,437	289,688		
Dutch East Indies,					18,420,126	1,754,827				
Peru,					201,980	24,105	33,998	14,368	4	16

	50	5	4,635	674	4,287,262	359,240	10	11		
Portugal,										
Azore, Madeira and Cape Verde Islands,										
Santo Domingo,			1,350	210	249,373	22,600				
Spain,	13,134,088	1,253,228	10	4	264,365	30,702	12,215	4,236	33	123
Cuba,	4,913,350	446,618	10	3	169,400	16,400	36,636	6,027		
Porto Rico,			738	189	228,730	31,511	74,251	32,660	41,775	84,922
Philippine Islands,					1,123,251	131,433	611	269	6	24
Spanish possessions in Africa and adjacent islands,					751,750	71,870	162	52		
Sweden and Norway,					395,500	30,236	95	93		
Switzerland,	188,785	13,900	586,521	46,881	11,772,106	912,241	19,260	3,213		
Turkey in Africa,					1,419,040	123,340				
Uruguay,			4,680	1,022	3,492,158	385,627	18,588	8,459		
Venezuela,					973,130	109,261	10,590	4,627	62	303
All other countries,	430	81	36,489	3,322	5,189,612	521,204	19,478	6,430	51	216
Total,	95,450,653	6,744,235	12,937,433	1,134,799	523,295,090	38,640,638	30,162,522	4,763,347	52,916	120,070

[TABLE NN.]

EXPORTS OF PETROLEUM, SHOWING THE QUANTITIES AND VALUES OF THE GRADES EXPORTED AND THE COUNTRIES TO WHICH THEY WERE SENT, FOR THE YEAR ENDING JUNE 30, 1891.

(Compiled from data United States Treasury Department.)

	CRUDE OIL.		NAPHTHA.		REFINED OIL.		LUBRICATING OIL.		RESIDUUM.	
	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Barrels.	Dollars.
Argentine Republic,			35,970	4,536	3,476,192	353,788	354,667	80,681		
Austria-Hungary,	1,753,652	95,136			716,912	39,867	15,960	2,020		
Belgium,	424,748	30,580	220,884	19,070	32,397,015	1,768,197	2,337,030	302,938		
Brazil,			26,989	4,589	10,470,656	1,047,612	218,171	73,726		
Guatemala,			200	65	212,944	28,125	3,663	1,533	13	60
Nicaragua,			4,640	993	386,185	45,485	6,051	2,103	41	214
Salvador,			40	12	106,995	24,353	1,434	718		
Chile,			3,788	673	1,606,135	162,315	186,388	56,554		
China,					27,160,660	2,586,321	20,518	5,339		
Colombia,	1,000	85			712,532	85,380	31,224	9,971	132	546
Denmark,			54,420	3,783	9,135,043	556,575	68,956	9,857		
Ecuador,			200	55	284,177	31,152	2,786	1,614	2	8
France,	61,663,973	3,485,559	2,831,929	234,155	3,764,974	279,295	3,948,257	537,508	1,500	7,400
French West Indies,					381,512	37,685	10,069	3,449	1	5
French East Indies,					1,992,630	187,454	200	130		
French possessions in Africa and adjacent isl's.,			6,905	870	2,013,450	190,186				
Germany,	3,107,137	137,538	3,227,106	232,036	162,187,071	8,599,741	4,186,225	590,579		
Great Britain and Ireland,			5,058,325	421,126	81,028,529	4,820,834	18,767,573	2,553,646	7,552	18,549
Gibraltar,					677,930	62,041			6	18

Nova Scotia, N. Brunswick, Prince Edw.'s Is.,	4,700	549	2,440,254	213,414	168,224	34,307	25	50
Quebec, Ontario, Manitoba and Northwest Ter.,	4,139	5,082	1,911,067	189,032	76,001	20,446	826	4,124
British Columbia,	3,802	741	283,155	56,482	45,553	13,680	...	...
Newfoundland and Labrador,	101	15	586,783	47,865	8,994	2,505	...	...
British West Indies,	8	2,373	2,056,168	216,112	19,630	6,456	53	228
British Guiana,	...	...	511,047	50,692	7,102	3,138	...	...
British East Indies,	...	...	39,659,850	3,714,421	30,276	12,184	...	...
Hong Kong,	...	...	10,814,630	1,040,208	3,780	1,191	...	...
British possessions in Africa and adjacent isl's.,	9,238	2,995	2,680,201	321,626	24,771	15,249	...	...
British possessions in Australia,	54,905	13,973	10,276,095	1,149,898	446,508	96,679	...	...
Greece,	...	...	1,679,640	158,540	...	...	...	...
Hawaiian Islands,	100	13	1,313,140	179,191	22,621	8,812	...	...
Hayti,	200	354	289,790	40,288	4,784	2,733	83	396
Italy,	100,000	36	20,955,728	1,495,511	591,996	74,031	...	...
Japan,	...	...	31,000,629	2,878,861	53,063	15,716	...	...
Mexico,	3,854,176	718	2,168,834	245,901	98,921	35,491	69	437
Netherlands,	...	...	54,879,032	2,794,315	1,504,623	191,582	...	...
Dutch East India,	...	...	21,633,290	2,052,937	...	...	...	...
Peru,	...	...	319,574	37,713	39,107	15,250	...	...
Portugal,	4,400	549	5,035,331	417,267	4,235	487	...	...
Azores, Madeira and Cape Verde Islands,	...	...	313,674	28,866	...	...	...	...
Santo Domingo,	1,617	324	210,739	23,915	6,730	2,408	38	119
Spain,	17,103,416	1,485,552	90,212	8,238	16,363	3,278	...	...
Cuba,	3,300,455	280,144	65,576	8,502	100,712	42,552	27,656	44,924
Philippine Islands,	...	153	1,004,400	96,564	...	...	...	...
Spanish possessions in Africa and adjacent isl's.,	...	...	320,860	30,651	208	111	...	...
Sweden and Norway,	102,200	41,930	8,937,350	686,948	5,531	1,519	...	...
Turkey in Europe,	...	...	245,832	22,199	120	60	...	...
Turkey in Africa,	...	...	1,923,520	173,591	495	330	...	...

[TABLE NN.]—EXPORTS OF PETROLEUM—*Concluded.*

	CRUDE OIL.		NAPHTHA.		REFINED OIL.		LUBRICATING OIL.		RESIDUUM.	
	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Barrels.	Dollars.
Uruguay, . . . . .	.....	.....	4,190	967	3,165,880	320,950	40,812	10,449	.....	.....
Venezuela, . . . . .	.....	.....	55	12	1,165,142	128,086	9,353	4,381	43	218
All other countries, . . . . .	.....	.....	1,103	309	4,381,840	430,073	25,015	8,212	26	126
Total,	91,415,095	5,876,452	12,171,147	993,056	571,119,805	40,221,201	33,514,730	4,858,603	38,066	77,422

[TABLE OO.]
EXPORTS OF PETROLEUM, SHOWING THE QUANTITIES AND VALUES OF THE GRADES EXPORTED AND THE COUNTRIES TO WHICH THEY WERE SENT, FOR THE YEAR ENDING JUNE 30, 1892.
(Compiled from data United States Treasury Department.)

	CRUDE OIL.		NAPHTHA.		REFINED OIL.		LUBRICATING OIL.		RESIDUUM	
	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Barrels.	Dollars.
Austria—Hungary,	1,636,208	112,088	. . . . .	. . . . .	. . . . .	. . . . .	24,850	3,131	. . . . .	. . . . .
Belgium, . . . . .	. . . . .	. . . . .	156,600	14,600	31,471,121	1,451,302	2,632,954	316,575	. . . . .	. . . . .
Denmark, . . . . .	. . . . .	. . . . .	. . . . .	. . . . .	7,019,575	336,621	52,991	7,721	. . . . .	. . . . .
France,	69,100,657	3,045,461	1,561,284	101,916	3,005,535	205,560	2,461,722	406,204	4,902	25,600
Germany,	5,247,209	165,856	3,471,652	230,214	133,417,314	6,158,730	4,512,639	661,296	. . . . .	. . . . .
Gibraltar, . . . . .	. . . . .	. . . . .	. . . . .	. . . . .	412,360	33,277	. . . . .	. . . . .	. . . . .	. . . . .
Greece, . . . . .	. . . . .	. . . . .	. . . . .	. . . . .	1,324,000	100,370	. . . . .	. . . . .	. . . . .	. . . . .
Italy, . . . . .	. . . . .	. . . . .	. . . . .	. . . . .	22,324,113	1,456,946	414,971	66,036	. . . . .	. . . . .
Netherlands, . . . . .	. . . . .	. . . . .	. . . . .	. . . . .	76,607,180	3,288,860	2,229,116	289,473	. . . . .	. . . . .
Portugal, . . . . .	. . . . .	. . . . .	7,690	915	4,063,230	282,392	64,050	6,827	. . . . .	. . . . .
Spain,	17,064,929	1,111,306	. . . . .	. . . . .	212,450	15,465	50,736	8,437	. . . . .	. . . . .
Sweden and Norway,	296,177	16,100	487,822	34,327	11,158,824	776,047	17,045	2,477	. . . . .	. . . . .
England,	2,629	181	6,798,390	489,200	86,288,272	4,179,439	16,867,366	2,554,300	1,459	4,569
Scotland, . . . . .	. . . . .	. . . . .	. . . . .	. . . . .	288,962	27,147	1,910,840	262,614	. . . . .	. . . . .
Ireland, . . . . .	. . . . .	. . . . .	15,026	1,539	8,374,543	564,235	1,600	192	. . . . .	. . . . .
Nova Scotia, New Brunswick and Prince Edward's Island, . . . . .	. . . . .	. . . . .	3,050	415	2,687,884	259,363	112,457	24,217	. . . . .	. . . . .
Quebec, Ontario, Manitoba, etc.,	3,500	350	7,349	769	2,159,331	181,795	70,509	13,749	1,497	7,461
British Columbia, . . . . .	. . . . .	. . . . .	7,253	1,370	283,511	48,403	42,712	12,318	. . . . .	. . . . .
Newfoundland and Labrador, . . . . .	. . . . .	. . . . .	1,099	234	604,685	47,506	13,354	3,814	10	25
Guatemela, . . . . .	. . . . .	. . . . .	240	74	193,773	25,873	9,612	3,334	. . . . .	. . . . .

[TABLE OO]—EXPORTS OF PETROLEUM—Continued.

	CRUDE OIL.		NAPHTHA.		REFINED OIL.		LUBRICATING OIL.		RESIDUUM.	
	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Barrels.	Dollars.
Nicaragua,			105	20	316,553	32,712	11,257	2,745	13	73
Salvador,					161,433	21,846	3,411	1,264	1	5
Mexico,	3,499,514	238,173	333	55	1,094,474	192,479	164,775	46,304	25	114
British West Indies,			1,130	319	2,001,008	176,055	19,459	6,535	66	300
French West Indies,					396,460	33,741	877	316	10	55
Hayti,			8,613	1,320	236,906	35,885	1,644	693	112	522
Santo Domingo,			1,300	217	369,742	34,024	10,618	4,164	17	60
Cuba,	6,316,406	378,216	1,250	240	235,362	24,802	171,554	69,880	4,801	6,204
Porto Rico,	421,848	33,905	250	77	708,488	64,219	5,334	2,256		
Argentine Republic,			48,466	7,040	4,825,196	403,619	238,419	53,001		
Brazil,			29,048	4,699	14,028,476	1,195,215	268,289	81,877	20	124
Chile,			7,550	2,080	3,662,758	296,061	193,557	53,382	20	67
Colombia,	3,690	204	2,040	226	709,884	70,605	34,326	41,523	108	420
British Guiana,					638,262	53,363	4,227	2,189		
Peru,			520	146	279,435	26,685	32,437	12,160	15	49
Uruguay,			785	201	4,293,400	368,189	8,351	3,650		
Venezuela,			1,100	282	1,155,539	112,322	11,895	4,967	61	322
China,					17,370,600	1,249,215	3,367	1,810		
East Indies, British,					37,031,290	2,942,797	101,019	26,841		
East Indies, Dutch,					17,017,200	1,302,676				
East Indies, French,					1,858,920	139,720				
Hong Kong,			3,800	660	16,529,790	1,304,380	910	347		
Japan,					23,761,930	1,798,792	45,410	13,622	3	25

British possessions in Australasia,	53,987	13,239	10,375 260	1,015,859	643,778	112,100	35	198
Hawaiian Islands, . . . . .	.....	.....	433,690	51,216	19,094	7,780	.....	.....
Philippine Islands, . . . . .	.....	.....	575,150	43,001	.....	.....	.....	.....
British possessions in Africa and ad- jacent Islands,	12,050	3,112	3,563,289	371,494	79,209	33,788	25	150
Canary Islands,	20	6	334,850	26,856	50	12	.....	.....
French possessions in Africa and ad- jacent Islands, . . . . .	.....	.....	2,054,770	162,012	.....	.....	.....	.....
Egypt, . . . . .	.....	.....	1,540,190	111,794	2,000	1,200	.....	.....
All other countries,	38,176	3,351	5,427,090	440,259	24,265	7,949	75	314
Total,	103,592,767	912,921	564,896,658	33,541,224	33,591,076	5,203,550	13,270	46,657

[TABLE PP.]
 EXPORTS OF ILLUMINATING OIL, SHOWING QUANTITIES, VALUES AND COUNTRIES TO WHICH SENT, FROM JULY 1, 1863, TO
 JUNE 30, 1892.
 (Compiled from data United States Treasury Department.)

YEAR ENDING JUNE 30.	1864.		1865.		1866.		1867.		1868.	
	QUANTI- TIES.	VALUES.	QUANTI- TIES.	VALUES.	QUANTI- TIES.	VALUES.	QUANTI- TIES.	VALUES.	QUANTI- TIES.	VALUES.
	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.
Europe—Great Britain and Ireland.	3,526,675	1,886,770	3,065,232	2,200,163	9,234,112	4,798,626	17,156,671	5,930,395	8,106,116	2,301,794
Germany,	634,563	296,438	1,075,063	808,898	4,436,267	2,327,020	11,140,306	3,623,197	15,897,059	4,345,001
France,	1,366,750	628,272	1,670,805	1,135,267	1,773,112	1,003,522	4,639,176	1,639,203	4,773,104	1,340,208
Belgium,	2,240,150	1,128,930	2,557,092	1,844,075	7,238,257	3,972,360	12,638,372	4,600,036	11,066,636	3,233,455
Italy,	607,730	323,662	247,402	184,627	1,839,384	1,019,251	2,061,245	799,133	4,869,640	1,423,009
Netherlands,	514,113	262,349	302,051	208,807	740,855	417,756	2,921,019	984,416	4,200,729	1,319,209
Spain,	132,612	74,087	106,295	70,249	342,838	173,251	738,818	263,440	1,478,054	431,468
Russia, on Baltic and White seas,	346,692	174,685	181,452	135,726	1,627,083	831,865	867,608	282,019	2,098,153	598,240
Austria,							49,825	21,000	440,567	125,702
Portugal,	36,779	27,159	75,114	57,209	282,537	145,395	388,612	143,051	460,643	121,744
Sweden and Norway,	34,250	20,747					96,156	30,198		
Denmark,	2,713	2,123					213,564	58,572	312,316	82,728
All other,	33,550	20,007	40,200	35,821	897,170	491,398	2,365,236	865,735	5,442,015	1,608,651
Total,	9,536,577	4,851,229	9,311,712	6,680,842	28,461,615	15,183,444	55,306,608	19,720,455	59,181,032	26,937,209
British—North American possessions,	231,420	120,768	309,410	236,519	683,329	369,191	566,178	284,860	443,941	155,608

Mexico.	27,316	15,901	31,502	25,657	183,136	97,687	135,159	60,887	251,899	92,909
Central American States and British Honduras.	9,881	7,045	4,587	3,571	9,748	5,958	6,226	2,629	9,269	2,722
West Indies.	386,144	221,593	643,021	516,345	1,160,400	644,894	979,912	421,992	1,366,751	438,575
South America—Brazil.	298,316	192,369	173,965	144,751	723,582	367,300	431,205	181,556	747,785	249,758
Argentine Republic.	110,791	68,325	169,240	141,818	423,510	260,860	606,417	240,770	357,580	127,861
Venezuela.	50,454	33,053	18,347	13,910	72,641	45,304	67,591	25,594	53,374	22,470
U. S. of Colombia.			21,104	16,985	42,935	26,700	81,196	38,535	39,386	13,296
Uruguay.			21,845	18,063	85,582	52,205	75,700	30,855	157,040	54,907
Guianas.			24,329	19,439	23,440	12,793	50,256	19,833	49,734	16,333
Chile.	87,537	55,010	11,200	10,335	168,320	107,306	310,543	171,457	219,160	66,005
Peru.	130,312	83,963	62,954	57,682	110,986	62,332	290,790	128,014	367,240	131,833
All other.					20,025	16,020	8,998	4,750		
Total.	697,410	432,720	502,989	422,983	1,671,021	950,880	1,972,696	841,364	2,001,099	682,573
Asia and Oceania—China.	9,899	5,728	2,790	2,535	49,914	29,165	72,120	32,296	129,760	38,952
British East Indies.	459,205	303,589	8,150	7,250	35,000	23,236	113,500	45,330	318,500	109,560
Japan.					2,000	1,000			32,000	12,848
British possessions in Australasia.			764,700	633,279	1,014,771	701,605	2,411,379	1,165,653	2,749,001	1,024,237
Hawaiian Islands.	10,497	7,556	9,140	8,638	20,000	12,985	18,100	8,896	23,300	9,642
Dutch East Indies.			4,000	3,800	6,000	4,320	42,230	19,012	138,000	48,320
Hong Kong.										
All other.	220	182	47,200	41,528	117,430	88,762	114,955	52,954	270,345	88,736
Total.	479,821	317,255	935,980	757,030	1,245,115	861,073	2,772,284	1,264,141	3,660,906	1,332,315
Africa.	278,230	121,456	42,583	39,159	91,086	53,538	380,464	168,375	302,530	108,583
All other countries.			3,190	2,305	4,427	2,521	6,034	2,480	4,962	1,649
Grand Total.	11,646,749	6,087,467	11,685,574	8,685,501	33,509,877	18,169,186	62,125,561	22,297,183	67,222,387	19,752,143

[TABLE PP.]—Continued.

	1869.		1870.		1871.		1872.		1873.	
	QUANTI- TIES.	VALUES.	QUANTI- TIES.	VALUES.	QUANTI- TIES.	VALUES.	QUANTI- TIES.	VALUES.	QUANTI- TIES.	VALUES.
YEAR ENDING JUNE 30.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.
Europe—Great Britain and Ireland. . .	11,040,062	3,550,402	8,386,112	2,558,490	15,144,670	3,812,828	10,088,136	2,483,074	15,741,151	3,539,548
Germany,	21,500,841	6,823,078	31,241,137	9,330,822	34,381,678	8,523,866	35,055,780	8,325,381	52,113,733	11,469,151
France,	4,261,982	1,370,901	2,925,090	906,556	2,277,229	552,376	2,121,914	510,644	705,182	186,470
Belgium,	12,932,081	4,185,478	15,022,980	4,582,184	17,384,603	4,295,037	16,363,278	3,880,509	22,616,550	5,127,408
Italy,	7,063,735	2,424,817	4,263,618	1,351,199	7,020,027	1,952,528	6,036,303	1,561,316	6,147,649	1,558,139
Netherlands,	4,672,663	1,491,362	6,976,595	2,145,305	7,890,367	2,015,223	10,153,494	2,439,003	9,676,174	2,217,511
Spain,	2,357,139	779,519	4,032,542	1,236,220	5,111,826	1,348,028	5,031,920	1,276,719	6,331,657	1,591,821
Russia, on Baltic and White seas,	3,894,249	1,283,575	2,023,389	592,005	7,162,091	1,854,805	5,327,704	1,367,407	7,403,860	1,667,781
Austria,	1,085,851	365,675	2,106,771	630,453	3,462,611	898,843	2,623,654	645,868	2,496,945	563,225
Portugal,	1,065,781	349,904	910,043	276,564	1,017,042	253,470	1,188,511	272,378	1,171,754	267,163
Sweden and Norway,	343,610	111,228	108,562	31,368	550,335	145,431	1,832,012	427,061	1,817,824	378,387
Denmark,	1,387,688	460,156	1,068,244	295,471	. . . . .	1,442,390	2,346,894	574,314	5,971,331	1,278,600
All other,	6,464,392	2,169,325	9,419,391	2,919,923	14,035,521	3,740,781	12,228,452	3,213,201	9,349,014	2,434,190
Total,	77,807,074	25,374,422	88,484,474	26,856,460	121,201,190	30,836,606	110,398,052	26,977,875	141,542,824	32,279,394
British North American possessions, . .	574,315	198,042	638,952	201,540	460,612	130,360	405,611	128,307	49,806	132,506
Mexico,	171,851	64,657	457,870	157,034	308,824	90,073	538,346	172,280	430,829	143,149
Central American States and British Honduras,	4,896	1,830	1,619	486	12,948	4,180	24,275	8,479	21,770	6,991

West Indies,	1,865,728	638,242	2,502,202	811,864	2,585,072	703,641	2,520,501	721,567	2,607,982	735,017
South America—Brazil,	813,672	278,885	1,506,063	464,559	1,256,990	353,028	1,475,750	417,764	2,083,411	701,198
Argentine Republic,	151,994	51,565	429,146	138,476	572,704	161,576	470,323	139,136	964,150	288,240
Venezuela,	91,256	32,331	67,894	21,993	84,907	25,431	113,029	33,318	164,908	45,406
U. S. of Colombia,	64,220	22,346	113,100	34,173	219,501	61,380	147,991	48,874	167,827	51,761
Uruguay,	35,150	11,772	185,479	57,867	546,966	162,238	785,904	230,207	562,240	160,302
Gulanas, . . . . .	.....	.....	.....	.....	.....	.....	.....	.....	104,287	29,449
Chile,	336,270	124,117	255,628	87,307	595,405	164,290	309,080	90,974	427,300	126,939
Peru,	53,856	19,018	294,703	92,057	359,846	104,923	303,389	89,162	208,110	63,563
Total,	1,546,418	540,034	2,852,003	896,432	3,566,319	1,032,806	3,605,496	1,049,435	4,682,233	1,466,858
Asia and Oceania—China,	108,770	36,417	470,187	142,399	984,150	55,490	702,280	207,528	971,053	290,426
British East Indies,	81,000	28,622	73,000	27,400	165,720	55,362	730,470	209,750	60,000	18,050
Japan,	4,480	2,140	.....	.....	.....	.....	117,250	38,855	463,550	131,709
British possessions in Australasia,	1,649,346	604,253	1,530,259	507,003	2,443,647	735,275	2,589,585	792,615	2,672,140	806,102
Hawaiian Islands,	13,770	6,069	22,960	9,127	22,500	8,600	28,450	11,627	59,690	24,454
Dutch East Indies,	45,792	16,567	235,263	63,400	509,680	149,975	18,000	5,400	807,020	234,405
Hong Kong, . . . . .	.....	.....	.....	.....	.....	.....	.....	.....	1,353,702	97,364
All other, . . . . .	.....	.....	.....	.....	.....	.....	.....	.....	.....	370,916
Total,	1,903,158	694,068	2,331,669	749,389	3,325,697	1,004,702	4,176,035	1,265,175	6,717,403	1,973,426
Africa,	45,204	19,835	214,116	73,078	251,072	77,009	242,376	69,239	1,261,899	363,507
All other countries,	215,788	80,152	359,540	117,910	902,221	260,299	628,885	178,751	345,608	94,887
Grand total,	84,403,492	27,631,042	97,902,505	29,864,193	132,608,955	34,138,736	122,539,575	30,566,108	158,102,414	37,195,735

[TABLE PP--Continued.]

YEAR ENDING JUNE 30.	1874.		1875.		1876.		1877.		1878.	
	QUANTI- TIES.	VALUES.	QUANTI- TIES.	VALUES.	QUANTI- TIES.	VALUES.	QUANTI- TIES.	VALUES.	QUANTI- TIES.	VALUES.
Europe—Great Britain and Ireland. . . .	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.
Germany,	25,079,008	4,353,405	22,258,297	3,036,360	25,201,057	3,420,632	31,029,227	7,035,438	36,650,663	5,219,215
France,	72,398,842	11,730,861	63,153,516	8,092,491	66,056,328	8,559,859	87,357,471	17,292,964	85,632,598	11,460,476
Belgium,	1,971,742	329,382	2,022,408	223,557	1,174,330	127,328	361,235	71,157	.....	.....
Italy,	34,101,776	5,506,631	28,601,255	3,656,989	32,329,030	4,182,963	30,164,924	6,503,681	37,958,310	4,989,835
Netherlands,	9,189,952	1,745,580	8,543,761	1,310,519	10,591,551	1,590,911	11,421,725	2,460,377	15,972,383	2,368,549
Spain,	13,901,156	2,385,917	10,109,370	1,270,790	12,245,288	1,589,142	8,600,646	1,752,652	14,906,499	1,984,535
Russia, on Baltic and White seas,	5,544,146	1,009,990	5,921,550	886,349	6,991,823	1,065,088	10,792,755	2,391,184	8,901,411	1,241,154
Austria,	7,022,720	1,194,847	3,819,717	608,160	6,299,349	905,252	4,729,806	734,250	1,954,643	288,126
Portugal,	3,774,883	630,410	3,704,112	457,956	5,356,627	696,051	8,703,104	1,841,091	9,115,164	1,313,257
Sweden and Norway,	1,297,589	210,329	957,807	122,935	1,020,249	134,377	1,653,479	363,525	1,747,220	247,678
Denmark,	1,412,650	218,422	2,624,709	342,263	2,076,503	271,841	6,942,305	1,168,868	4,397,154	599,845
All other,	6,532,362	1,050,083	5,324,949	697,431	4,760,380	651,446	12,434,489	2,175,723	9,743,904	1,291,597
	11,207,137	2,198,931	5,842,547	896,754	5,945,549	929,602	10,769,899	2,514,504	11,045,500	1,747,968
Total,	194,433,963	32,564,688	162,883,998	21,602,854	180,048,064	24,124,552	225,561,065	46,275,414	238,025,449	32,752,093
British North American Possessions,	699,077	155,418	908,301	142,325	790,199	131,578	895,646	198,594	1,252,836	215,168
Mexico,	623,626	164,160	465,662	108,368	759,984	171,348	784,102	221,894	805,087	173,438
Central American States and British Honduras,	21,172	5,827	41,349	10,990	55,448	11,982	43,280	14,656	97,145	20,518

West Indies.	3,320,947	685,433	3,131,822	547,984	3,464,204	629,301	3,887,172	892,539	3,263,873	541,433
South America—Brazil.	2,075,894	467,943	2,999,652	574,307	2,680,805	498,294	3,539,733	901,025	3,802,594	655,797
Argentine Republic.	657,500	139,550	278,975	52,060	766,500	144,197	850,972	228,374	1,656,889	282,720
Venezuela.	194,689	41,667	250,333	44,200	293,123	52,038	330,469	78,048	341,385	61,275
U. S. of Colombia.	186,587	42,446	193,699	38,529	177,285	36,178	172,512	43,936	465,460	78,894
Uruguay.	325,260	69,385	444,000	80,641	378,640	73,132	676,020	148,541	551,966	95,094
Gulanas.	171,331	36,416	236,144	42,208	211,025	38,406	281,951	65,252	550,220	86,870
Chile.	733,100	168,745	641,820	119,871	441,910	84,413	591,150	132,962	650,920	111,891
Peru.	257,230	55,074	515,331	102,263	242,807	45,482	316,635	72,252	513,534	86,417
All other. . . . .	.....	.....	.....	.....	.....	.....	.....	.....	13,580	2,117
Total.	4,601,591	1,021,236	5,559,954	1,054,079	5,192,095	972,110	6,750,642	1,693,390	8,546,540	1,400,175
Asia and Oceania—China.	827,510	196,041	2,120,790	410,569	937,392	177,369	1,327,970	317,704	3,671,007	597,269
British East Indies.	1,001,360	224,346	1,232,070	236,675	690,000	141,150	1,872,923	510,579	3,036,990	532,137
Japan.	526,150	120,065	2,585,030	502,824	2,123,854	399,676	2,148,551	494,323	7,944,728	1,305,713
British Possessions in Australasia.	3,692,951	811,442	2,128,355	434,956	2,314,279	467,950	3,242,392	867,990	4,588,615	841,271
Hawaiian Islands.	61,093	17,219	43,740	10,745	23,120	5,429	87,721	28,700	140,370	32,488
Dutch East Indies.	1,959,710	429,569	4,858,340	960,650	3,093,539	619,891	10,502,954	2,606,646	8,158,100	1,414,594
Hong Kong.	120	60	250,590	46,886	265,060	51,816	218,700	54,100	582,000	98,125
All other.	2,091,366	447,341	1,933,083	344,710	1,832,159	318,331	1,833,889	425,085	3,411,780	575,486
Total.	10,160,260	2,246,083	15,151,998	2,948,045	11,279,454	2,173,612	21,235,100	5,299,127	31,533,590	5,397,033
Africa.	2,674,537	578,881	3,131,900	565,893	2,868,904	509,638	3,054,133	764,000	4,950,313	826,198
All other countries.	685,331	139,229	276,949	49,823	156,321	31,517	290,704	64,918	739,700	127,570
Grand total.	217,220,504	37,560,955	191,551,953	27,030,361	204,814,673	28,755,638	292,441,844	55,401,132	289,214,541	41,513,676

[TABLE PP--Continued.]

YEAR ENDING JUNE 30.	1879.		1880.		1881.		1882.		1883.	
	QUANTI- TIES.	VALUES. Dollars.	QUANTI- TIES.	VALUES. Dollars.	QUANTI- TIES.	VALUES. Dollars.	QUANTI- TIES.	VALUES. Dollars.	QUANTI- TIES.	VALUES. Dollars.
Europe--Great Britain and Ireland. . . .	34,751,409	3,637,609	48,832,070	3,829,174	47,310,213	4,691,581	70,934,445	5,880,495	60,689,023	5,037,743
Germany.	102,422,272	10,168,432	113,024,559	8,664,098	91,980,568	8,538,570	123,728,566	9,694,187	118,781,859	9,219,609
France.	1,656,209	192,457	338,979	25,544	749,015	63,843	2,517,752	206,618	2,122,804	162,002
Belgium.	41,445,848	4,099,858	37,058,778	2,845,852	32,980,373	3,056,104	46,956,099	3,674,948	43,852,218	3,354,772
Italy.	16,565,508	1,936,191	16,998,347	1,636,354	12,751,966	1,406,075	24,982,611	2,609,149	14,318,657	1,384,194
Netherlands.	17,564,344	1,753,584	21,556,667	1,657,121	18,941,326	1,856,375	21,663,293	1,672,336	23,648,441	1,849,370
Spain.	6,630,770	747,089	6,651,382	603,422	3,359,296	347,695	2,406,509	247,509	880,676	82,986
Russia on Baltic and White Seas.	3,141,915	336,685	1,274,660	109,379	1,029,573	99,755	2,502,655	216,416	1,232,180	103,817
Austria.	12,612,780	1,326,107	16,530,306	1,257,797	15,232,161	1,498,181	24,180,311	1,951,773	15,734,103	1,177,494
Portugal.	2,290,284	230,590	2,198,915	181,982	2,682,622	265,689	3,049,060	262,082	2,530,287	219,545
Sweden and Norway.	6,528,181	659,167	4,730,840	377,852	10,573,473	990,630	9,427,287	773,196	6,040,846	497,948
Denmark.	10,838,392	1,082,102	6,893,515	510,452	15,499,204	1,464,490	13,948,322	1,092,539	11,102,877	872,790
All other.	9,851,448	1,262,589	7,838,230	769,881	14,988,791	1,738,039	18,252,307	1,970,327	6,205,938	626,810
Total.	266,299,360	27,432,940	283,627,248	22,468,905	267,898,581	26,077,047	364,549,217	30,251,575	307,140,909	24,588,710
British North American Possessions. . .	1,285,213	170,532	1,037,349	125,349	1,571,297	220,543	3,299,306	383,944	3,255,069	370,760
Mexico.	936,487	152,438	1,128,083	155,328	1,128,155	173,555	1,472,766	226,115	1,755,855	249,404
Central American States and British Honduras.	147,597	21,372	135,638	16,992	231,402	32,276	288,111	39,947	184,441	23,662

West Indies,	3,365,421	419,008	2,939,599	317,700	3,745,120	452,858	4,642,497	509,002	2,939,599	345,230
South America—Brazil,	4,222,110	558,524	3,909,097	438,327	5,556,728	153,362	5,473,525	663,575	6,065,728	667,444
Argentine Republic,	943,470	117,192	1,432,777	158,956	1,158,400	146,510	1,257,648	146,112	1,815,526	188,782
Venezuela,	360,035	45,269	412,858	45,980	462,924	59,548	335,364	47,945	643,028	75,818
U. S. of Colombia,	192,358	27,619	458,342	51,108	429,897	61,196	233,747	31,793	272,054	36,314
Uruguay,	634,790	81,116	781,630	88,946	1,292,635	156,742	1,375,550	155,280	1,496,500	165,830
Gulanas,	775,233	97,205	433,775	45,687	467,925	60,081	583,426	73,349	651,240	77,758
Chile,	832,500	107,052	997,750	99,002	645,970	87,421	1,188,700	138,987	2,025,100	219,859
Peru,	601,115	76,589	145,682	12,933	113,000	13,805	287,500	33,131	421,300	45,266
All other,	26,500	3,240	19,147	2,264	21,000	2,497	85,450	9,691	120,011	14,360
Total,	8,590,681	1,113,806	8,521,058	943,203	10,148,480	1,341,102	10,880,910	1,229,863	13,510,487	1,491,431
Asia and Oceania—China,	5,443,000	690,358	3,576,866	366,367	4,553,200	554,898	9,682,340	1,064,243	6,093,460	639,377
British East Indies,	6,900,460	926,285	17,425,080	1,999,605	6,608,770	828,362	25,747,500	2,983,987	19,031,410	2,017,511
Japan,	15,295,370	1,959,643	13,539,381	1,405,165	7,078,100	853,173	17,768,830	2,000,796	22,955,802	2,553,482
British Possessions in Australasia,	2,791,789	463,028	4,451,667	550,784	3,707,029	555,691	5,199,110	740,467	3,901,124	528,219
Hawaiian Islands,	119,856	21,760	155,054	31,684	275,400	50,157	318,870	44,798	431,375	62,300
Dutch East Indies,	10,682,370	1,381,565	22,343,746	2,488,684	13,530,504	1,670,790	22,432,588	2,596,223	22,466,375	2,360,853
Hong Kong,	390,000	45,894	493,000	57,493	1,671,300	204,879	3,708,700	411,958	4,218,460	459,604
All other,	2,734,760	343,361	1,627,050	160,854	2,060,802	271,906	4,318,210	471,859	3,839,361	373,176
Total,	44,357,805	5,837,894	63,641,844	7,060,636	39,485,505	4,989,856	89,206,157	10,314,331	82,937,367	8,994,522
Africa,	6,032,997	766,765	5,733,963	623,045	6,859,723	873,179	12,349,946	1,388,701	6,349,966	672,152
All other Countries,	570,881	75,087	561,050	72,507	1,214,782	147,619	1,524,033	175,376	1,747,408	190,703
Grand total,	331,586,442	55,999,862	367,325,823	31,733,575	332,283,045	34,317,635	488,213,053	44,688,854	419,821,081	36,926,574

[TABLE PP—Continued.]

YEAR ENDING JUNE 30.	1884.		1885.		1886.		1887.		1888.	
	QUANTI- TIES.	VALUES.	QUANTI- TIES.	VALUES.	QUANTI- TIES.	VALUES.	QUANTI- TIES.	VALUES.	QUANTI- TIES.	VALUES.
	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.
Europe—Great Britain and Ireland. . .	48,781,791	4,323,588	62,911,717	5,284,840	73,447,181	6,180,411	71,627,222	5,318,987	68,787,549	5,121,227
Germany.	107,703,735	8,975,387	97,688,264	7,391,939	98,894,755	7,752,121	118,629,066	7,995,150	113,415,233	7,229,342
France.	1,864,772	159,347	104,350	8,428	520,536	39,787	4,913,742	334,036	2,048,441	155,101
Belgium.	42,732,079	3,561,188	48,529,333	3,810,679	48,371,109	3,833,852	44,226,513	3,012,092	45,765,138	3,254,456
Italy.	19,818,242	1,995,890	27,252,392	2,530,122	16,019,428	1,471,048	24,846,473	2,098,980	18,962,744	1,685,445
Netherlands.	24,445,076	2,053,927	25,781,510	2,047,597	38,794,144	3,066,215	44,727,434	3,068,051	34,232,908	2,402,118
Spain.	758,864	71,677	1,814,103	112,141	96	29	84,000	7,190	544,300	47,653
Russia, on Baltic and White seas. . .	529,156	42,815	213,120	16,942	275,047	20,848	.....	.....	105,233	7,785
Austria.	12,839,742	1,051,314	7,265,610	567,167	1,421,008	113,267	543,719	41,974	290,505	23,147
Portugal.	2,675,904	231,841	3,368,146	282,622	2,607,920	227,126	3,207,673	237,062	3,749,639	301,046
Sweden and Norway.	6,493,682	546,434	7,978,871	650,575	8,258,536	669,447	8,395,176	616,865	7,264,567	534,364
Denmark.	11,432,673	937,457	9,228,768	735,572	9,443,660	734,894	5,890,518	394,490	4,485,778	326,337
All other.	11,054,571	1,107,230	9,449,759	868,617	5,857,918	546,722	6,170,564	521,883	5,954,303	518,751
Total.	291,130,287	25,058,065	301,607,143	24,607,241	303,911,638	24,655,767	333,262,400	23,646,740	305,606,918	21,589,772
British North American Possessions. . .	3,323,536	372,495	3,893,200	405,062	3,596,142	392,617	4,958,657	493,512	5,151,454	494,698
Mexico.	1,444,002	197,552	1,623,770	224,492	1,260,943	175,186	2,173,677	254,929	1,154,775	151,738
Central American States and British Honduras.	405,005	52,374	367,739	48,852	426,822	54,583	565,156	67,951	603,051	74,802

West Indies,	2,870,324	350,154	3,518,781	385,657	3,547,505	355,105	4,231,281	457,054	5,902,849	453,339
South America—Brazil,	5,634,114	532,782	8,163,077	814,497	6,037,555	607,312	7,651,290	741,230	7,901,463	779,824
Argentine Republic,	2,111,620	240,315	3,638,710	366,085	2,398,656	240,618	4,140,630	393,022	5,177,465	334,839
Venezuela,	721,311	77,597	702,279	74,544	613,171	60,702	773,736	78,353	792,131	82,533
U. S. of Colombia,	402,676	50,469	383,372	41,954	482,477	55,388	658,443	68,805	636,724	72,380
Uruguay,	1,507,661	161,131	2,456,780	246,060	1,813,023	180,715	2,547,470	242,989	2,257,290	235,604
Gulanas,	491,166	55,878	905,771	63,269	618,330	63,364	634,470	64,680	664,533	65,725
Chile,	953,073	104,747	1,437,792	142,825	2,178,696	221,589	2,040,637	192,497	1,751,235	168,776
Peru,	295,909	30,210	337,455	31,490	602,618	56,084	195,290	19,436	441,621	43,965
All other,	50,690	5,680	8,340	848	179,210	20,894	251,560	28,436	105,450	11,416
Total,	11,568,220	1,258,809	17,733,576	1,781,572	14,923,796	1,506,726	18,653,526	1,829,448	17,727,972	1,795,062
Asia and Oceania—China,	8,383,830	835,949	15,421,150	1,454,979	26,272,320	2,417,100	7,263,822	635,448	10,732,810	1,045,701
British East Indies,	32,437,460	3,334,918	37,359,930	3,562,533	42,475,477	3,869,365	39,705,603	3,495,105	33,378,221	3,045,668
Japan,	18,005,350	1,849,453	19,739,043	1,861,183	24,259,270	2,282,307	21,983,462	1,951,962	26,384,190	2,473,668
British Possessions in Australasia,	4,306,367	576,915	7,315,365	912,986	7,734,790	968,436	4,380,859	537,473	9,356,439	1,098,183
Hawaiian Islands,	419,480	51,370	362,320	42,660	507,255	82,511	774,227	90,310	710,160	75,189
Dutch Indies,	20,217,493	2,085,495	20,745,431	2,024,732	22,338,260	2,119,612	23,843,569	2,161,507	25,013,010	2,328,290
Hong Kong,	4,856,250	505,376	7,725,330	714,399	6,820,380	613,750	2,808,700	240,309	4,470,880	421,385
All other,	6,065,659	606,836	7,633,743	671,096	4,290,756	398,160	5,240,660	462,069	5,045,325	473,312
Total,	94,691,889	9,843,339	115,682,312	11,244,568	134,698,508	12,751,301	106,000,902	9,574,183	115,089,035	10,961,396
Africa,	7,732,002	799,920	11,275,640	1,119,483	5,425,556	534,428	8,392,230	776,575	6,920,074	661,088
All other countries,	2,450,448	262,641	2,541,031	257,300	1,674,481	168,618	2,307,982	203,625	331,093	33,605
Grand total,	415,615,693	38,135,349	458,243,192	40,074,897	469,471,451	40,634,331	480,845,811	37,303,997	456,487,221	36,215,410

[TABLE PP—Concluded.]

	1889.		1890.		1891.		1892.	
	QUANTITIES.	VALUES.	QUANTITIES.	VALUES.	QUANTITIES.	VALUES.	QUANTITIES.	VALUES.
	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.
Europe—Great Britain and Ireland,	65,368,602	4,971,602	66,393,246	4,549,920	81,028,529	4,826,834	94,901,777	4,770,821
Germany,	138,518,352	8,455,898	140,264,089	7,766,452	162,187,071	8,599,741	133,417,314	6,158,730
France,	2,602,061	191,034	2,088,291	155,270	3,764,974	279,295	3,005,585	205,560
Belgium,	38,800,535	2,609,275	41,391,323	2,221,947	32,397,015	1,768,197	31,471,121	1,451,302
Italy,	18,825,621	1,727,534	19,747,751	1,642,830	20,955,728	1,495,511	22,324,113	1,456,946
Netherlands,	41,158,182	2,716,886	47,315,526	2,587,324	54,879,032	2,794,315	76,607,780	3,288,860
Spain,	183,216	17,248	169,406	16,400	90,212	8,236	212,450	15,465
Russia, on Baltic and White Seas,	119,690	8,430	.....	.....	.....	.....	112,130	7,208
Austria,	723,670	50,941	.....	.....	716,912	39,867	.....	.....
Portugal,	4,186,838	348,393	4,287,262	359,240	5,035,331	417,297	4,063,230	282,392
Sweden and Norway,	10,212,572	768,468	11,772,106	912,241	8,957,350	686,948	11,153,824	776,047
Denmark,	4,137,271	301,881	7,147,115	496,243	9,135,043	556,575	7,019,575	336,621
All other,	5,307,893	484,296	2,560,780	241,619	2,603,402	242,780	2,062,230	156,625
Total,	330,114,503	22,654,351	343,136,889	20,899,486	381,750,599	21,715,566	386,357,079	18,906,577
British North American Possession,	5,247,155	513,677	5,104,864	514,404	5,230,259	536,793	5,888,503	551,076
Mexico,	2,123,532	226,165	1,754,748	197,648	2,168,834	265,901	1,094,474	192,479
Central American States and British Honduras,	603,462	82,548	258,849	31,261	766,124	97,963	957,633	109,948
West Indies,	3,896,191	430,196	4,189,937	427,893	3,003,785	326,502	4,262,935	392,428

YEAR ENDING JUNE 30.

South America—Brazil,	8,834,260	890,012	8,635,291	876,641	10,470,656	1,047,612	14,028,476	1,195,215
Argentina Republic,	5,952,415	619,877	3,113,750	339,070	3,476,192	353,788	4,825,196	403,619
Venezuela,	1,036,272	113,363	973,130	109,261	1,165,142	128,036	1,155,539	112,322
United States of Colombia,	573,307	72,024	554,483	70,694	712,532	85,380	709,884	70,605
Uruguay,	2,523,820	267,171	3,492,158	385,027	3,165,880	320,950	4,293,400	398,189
Guianas,	651,259	67,505	1,134,212	112,096	511,047	50,692	893,172	75,398
Chile,	2,035,946	208,974	2,974,924	306,945	1,696,185	162,315	3,662,758	296,061
Peru,	425,055	46,924	201,980	24,105	319,574	37,713	279,435	26,685
All other,	67,020	8,321	185,285	22,746	284,177	31,152	127,026	10,196
Total,	22,099,354	2,294,774	21,330,213	2,247,185	21,711,365	2,217,638	29,974,866	2,558,290
Asia and Oceania								
China,	9,848,960	907,479	13,072,000	1,251,201	27,160,690	2,586,321	17,370,600	1,249,215
British East Indies,	41,834,151	3,734,276	44,023,425	4,070,875	39,659,850	3,714,421	37,031,290	2,942,797
Japan,	32,791,090	3,069,778	37,892,930	3,559,375	31,000,620	2,878,861	23,761,930	1,798,792
British Possession in Australasia,	7,551,161	958,027	7,976,572	970,768	10,276,095	1,149,898	10,376,260	1,015,859
Hawaiian Islands,	380,630	50,778	752,900	94,653	1,313,140	179,191	433,690	51,216
Dutch Indies,	22,939,540	2,181,964	18,420,126	1,754,827	21,633,290	2,052,937	17,017,200	1,302,676
Hong Kong,	6,720,810	640,606	11,150,229	1,137,255	10,814,530	1,040,208	16,529,790	1,304,380
All other,	7,708,310	711,376	1,764,270	164,465	2,997,030	284,018	4,520,776	341,651
Total,	129,774,652	12,244,284	135,052,443	13,003,449	144,855,324	13,885,855	127,041,536	10,006,586
Africa,	6,384,803	656,274	7,027,512	730,508	6,998,031	716,054	8,865,999	785,753
All other countries,	1,983,803	184,064	5,439,585	543,804	4,695,514	458,029	453,613	38,087
Grand total,	502,257,455	39,286,333	523,295,060	38,640,638	571,119,805	40,221,201	564,896,658	33,541,224

[TABLE QQ.]
EXPORTS OF ILLUMINATING OIL BY COUNTRIES, SHOWING PER CENT. OF TOTAL VALUE SENT TO EACH COUNTRY NAMED, FROM
JULY 1, 1863, TO JUNE 30, 1892.

(Compiled from data United States Treasury Department.)

YEAR ENDING JUNE 30	EUROPE.			BRITISH NORTH AMERICA.			MEXICO, CENTRAL AMERICAN STATES AND BRITISH HONDURAS.			WEST INDIES.			SOUTH AMERICA.		
	Gallons.	Dollars.	Per cent. of total value.	Gallons.	Dollars.	Per cent. of total value.	Gallons.	Dollars.	Per cent. of total value.	Gallons.	Dollars.	Per cent. of total value.	Gallons.	Dollars.	Per cent. of total value.
1864.	9,536,577	4,851,229	79.68	231,420	120,768	1.98	37,147	22,946	.38	386,144	221,593	3.64	697,410	432,720	7.11
1865.	9,311,712	6,680,842	76.92	309,410	236,519	2.72	36,089	30,228	.35	643,621	516,435	5.95	502,989	422,983	4.87
1866.	28,461,615	15,183,444	83.56	683,329	369,191	2.63	192,884	163,645	.57	1,160,400	644,894	3.55	1,671,021	950,880	5.23
1867.	55,306,608	19,270,455	86.53	566,178	234,800	1.65	141,385	61,516	.29	979,912	421,992	1.90	1,972,696	841,364	3.78
1868.	59,181,032	16,987,209	85.76	443,941	155,608	.78	261,166	95,631	.48	1,366,751	438,575	2.22	2,001,099	682,573	3.45
1869.	78,076,074	25,374,422	91.84	574,315	198,042	.71	176,747	66,547	.24	1,865,728	658,242	2.38	1,546,418	540,034	1.96
1870.	88,484,474	26,856,460	89.94	638,932	201,540	.67	459,489	157,520	.53	2,562,292	811,864	2.72	2,852,003	896,432	3.00
1871.	121,201,190	30,835,606	90.32	480,612	130,360	.38	316,772	94,253	.28	2,585,072	703,641	2.96	3,566,319	1,032,866	3.03
1872.	110,398,052	26,977,875	88.25	405,611	123,307	.41	562,619	180,759	.59	2,520,501	721,567	2.36	3,605,496	1,049,435	3.43
1873.	141,542,824	32,279,394	86.77	491,806	132,506	.36	452,569	150,140	.40	2,607,982	735,017	1.98	4,682,233	1,466,858	3.94
1874.	194,433,963	32,564,688	86.70	699,077	155,418	.41	644,798	169,987	.45	3,320,947	685,433	1.83	4,601,531	1,021,236	2.72
1875.	162,883,998	21,602,854	79.92	908,301	142,325	.53	507,011	119,358	.44	3,131,822	547,984	2.03	5,559,954	1,054,079	3.90
1876.	180,048,064	24,124,555	83.88	790,199	131,578	.46	815,432	183,330	.64	3,664,204	629,301	2.19	5,192,065	972,110	3.38
1877.	225,561,965	46,275,414	83.53	836,646	198,594	.36	827,382	236,550	.43	3,887,172	892,539	1.61	6,759,642	1,669,390	3.01
1878.	238,025,449	32,752,093	78.90	1,252,885	215,168	.52	902,232	193,956	.44	3,263,873	541,433	1.31	8,546,548	1,460,175	3.52
1879.	265,299,360	27,432,969	76.21	1,285,213	170,532	.45	1,084,084	173,810	.48	3,365,421	419,008	1.17	8,590,681	1,113,806	3.10

1880,	283,027,248	22,468,305	70.70	1,037,349	125,349	.39	1,263,721	172,230	.54	2,339,599	317,700	1.00	8,521,058	943,203	2.97
1881,	267,898,581	20,077,047	75.98	1,571,297	220,543	.64	1,859,557	205,431	.60	3,745,120	462,858	1.35	10,148,480	1,341,162	3.91
1882,	364,549,217	30,251,575	67.84	3,299,396	383,944	.86	1,740,877	266,062	.60	4,642,497	509,002	1.14	10,880,910	1,299,863	2.92
1883,	307,140,909	24,588,710	66.58	2,255,069	370,760	1.00	1,940,275	273,065	.74	2,439,599	345,230	.94	13,510,487	1,491,431	4.04
1884,	291,130,287	25,058,065	65.60	3,323,536	372,495	.98	1,849,007	249,926	.65	2,870,304	350,154	.92	11,568,220	1,258,809	3.30
1885,	301,607,143	24,607,241	61.41	3,893,200	405,602	1.01	1,991,509	273,344	.68	3,518,781	385,657	.96	17,733,576	1,781,572	4.45
1886,	303,911,698	24,655,767	60.68	3,596,142	392,617	.97	1,693,765	229,763	.57	3,547,505	395,105	.97	14,973,736	1,506,726	3.71
1887,	333,262,400	23,646,740	63.39	4,956,657	493,512	1.32	2,738,833	322,880	.86	4,231,281	457,034	1.22	18,953,826	1,829,448	4.90
1888,	305,606,918	21,589,772	59.61	5,151,454	494,608	1.36	1,757,826	226,540	.62	3,902,849	453,339	1.25	17,727,972	1,795,062	4.96
1889,	330,144,503	22,654,351	57.66	5,274,155	513,677	1.31	2,726,904	208,713	.79	3,896,191	431,196	1.09	22,099,354	2,234,774	5.84
1890,	343,136,889	20,899,486	54.09	5,104,864	514,404	1.33	2,013,647	228,909	.59	4,189,937	472,893	1.23	21,330,213	2,247,185	5.81
1891,	381,550,599	21,715,566	54.00	5,230,259	536,793	1.33	2,934,958	363,864	.90	3,003,785	326,502	.81	21,711,335	2,217,638	5.51
1892,	386,357,079	18,906,577	56.37	5,888,503	551,076	1.64	2,052,107	302,427	.90	4,262,935	392,428	1.17	29,974,886	2,558,290	7.63

[TABLE QQ—Continued.]

YEAR ENDING JUNE 30.	ASIA AND OCEANICA.			AFRICA.			ALL OTHER COUNTRIES.			TOTAL.	
	Gallons.	Dollars.	Percent. of total value.	Gallons.	Dollars.	Percent. of total value.	Gallons.	Dollars.	Percent. of total value.	Gallons.	Dollars.
1864.	479,821	317,255	5.21	278,230	121,456	2.00	.....	.....	.....	11,646,749	6,087,967
1865.	835,980	757,030	8.71	42,583	39,159	.45	3,190	2,305	.03	11,685,574	8,085,501
1866.	1,245,115	861,073	4.74	91,086	53,538	.30	4,427	2,521	.02	33,509,877	18,169,186
1867.	2,772,284	1,264,141	5.68	380,464	168,375	.76	6,034	2,480	.01	62,125,561	22,267,183
1868.	3,660,906	1,332,315	6.75	302,530	108,583	.55	4,962	1,649	.01	67,222,387	19,752,143
1869.	1,903,158	694,068	2.51	45,264	19,535	.07	215,788	80,152	.29	84,403,492	27,631,042
1870.	2,331,669	749,389	2.51	214,116	73,078	.24	359,540	117,910	.39	97,902,505	29,864,193
1871.	3,325,697	1,004,702	2.94	251,072	77,009	.23	902,221	260,299	.76	132,608,955	34,138,736
1872.	4,176,035	1,265,175	4.14	242,376	63,239	.23	628,885	178,751	.59	122,539,575	30,566,108
1873.	6,717,403	1,973,426	5.31	1,261,899	363,507	.98	345,668	94,887	.26	158,102,414	37,195,735
1874.	10,160,260	2,246,083	5.98	2,674,537	578,881	1.54	685,331	139,229	.37	517,220,504	37,560,955
1875.	15,151,998	2,948,045	10.91	3,131,900	565,893	2.09	276,649	49,823	.18	191,551,933	27,030,361
1876.	11,279,454	2,173,612	7.56	2,868,904	509,638	1.78	156,321	31,517	.11	204,814,673	28,755,638
1877.	21,235,100	5,299,127	9.56	3,054,133	764,600	1.38	290,704	64,918	.12	262,441,844	55,401,132
1878.	31,533,590	5,397,083	13.00	4,950,313	826,198	2.00	739,700	127,570	.31	289,214,541	41,513,676
1879.	44,357,805	5,837,384	16.22	6,032,997	776,765	2.16	570,881	75,087	.21	331,586,442	35,969,862
1880.	63,461,844	7,060,636	22.21	5,733,963	623,045	1.96	561,050	72,507	.23	367,325,823	31,783,575
1881.	39,485,505	4,989,856	14.54	6,869,723	873,179	2.55	1,214,782	147,619	.43	332,283,045	34,317,695
1882.	89,206,157	10,314,331	23.13	12,349,946	1,388,701	3.12	1,524,033	175,376	.39	488,213,033	44,588,864
1883.	82,937,367	8,994,522	24.36	6,349,966	672,152	1.82	1,747,408	190,703	.52	419,821,081	36,926,574
1884.	94,691,889	9,843,339	25.77	7,732,002	799,920	2.09	2,450,448	262,641	.69	415,615,693	38,195,349

1885.	115,682,312	11,244,568	28.06	11,175,649	1,119,483	2.79	2,541,031	257,300	.64	458,243,192	40,074,827
1886.	134,698,508	12,751,301	31.38	5,425,556	534,428	1.31	1,674,481	168,618	.41	469,471,451	40,634,331
1887.	106,000,902	9,574,183	25.67	8,392,230	776,575	2.08	2,307,982	203,625	.55	480,845,811	37,303,397
1888.	115,089,035	10,961,396	30.28	6,920,074	661,088	1.83	331,093	33,605	.09	456,487,221	36,215,410
1889.	129,774,652	12,244,284	31.17	6,384,803	656,274	1.67	1,983,803	184,464	.47	502,257,455	39,286,333
1890.	135,052,443	13,003,449	33.65	7,027,512	730,508	1.89	5,439,585	543,804	1.41	523,296,090	38,640,638
1891.	144,855,324	13,885,855	34.53	6,938,031	716,054	1.78	4,695,514	458,929	1.14	571,119,805	40,221,201
1892.	127,041,536	10,006,568	29.84	8,865,999	785,753	2.34	453,613	38,087	.11	564,896,658	33,541,224

[TABLE RR.]

PETROLEUM EXPORTS BY GRADES AND SHIPPING PORTS, FOR EACH YEAR ENDING JUNE 30, FROM JULY 1, 1863, TO JUNE 30, 1892.

	CRUDE PETROLEUM.				REFINED PETROLEUM.								TOTAL.	
	NAPHTHAS.		ILLUMINATING OILS.		LUBRICATING OILS.		RESIDUUM.							
	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.		
Philadelphia,	2,087,114	670,774	18,167	4,842	2,878,148	1,413,597	None.	None.	None.	None.	4,983,429	2,089,213		
New York,	8,443,631	3,605,780	157,076	62,592	6,729,408	3,508,867	..	..	..	..	15,330,115	7,177,239
Baltimore,	338,324	140,032	146,956	41,066	223,257	127,518	..	..	..	..	708,537	308,616
Boston, . . . . .	..	..	90,158	40,732	1,691,726	974,485	..	..	..	..	1,731,884	1,015,217
All other ports, . . .	256,364	124,045	25,840	4,859	124,210	63,500	..	..	..	..	406,414	192,464
Total, 1864, . . .	11,125,433	4,540,651	438,197	154,091	11,646,749	6,087,967	..	..	..	..	23,210,379	10,782,689
Philadelphia,	1,110,907	488,751	43,992	9,640	3,886,019	2,704,960	None.	None.	None.	None.	5,040,918	3,203,351		
New York,	11,872,535	6,994,009	61,060	29,541	6,001,318	4,466,718	..	..	..	..	17,934,973	11,490,208
Baltimore,	72,996	60,721	272,090	87,228	314,963	248,781	..	..	..	..	660,049	336,730
Boston,	7,700	8,551	97,705	41,674	1,363,668	1,171,931	..	..	..	..	1,463,073	1,222,156
All other ports, . . .	266,130	151,937	6,100	5,860	119,606	93,111	..	..	..	..	391,836	250,908
Total, 1865, . . .	13,330,328	7,703,969	480,947	173,943	11,685,574	8,685,501	..	..	..	..	25,496,849	16,563,413
Philadelphia,	5,096,937	1,639,991	164,198	25,771	16,701,452	8,864,555	None.	None.	None.	None.	21,991,687	10,530,317		
New York,	11,290,623	4,616,171	67,272	13,007	13,593,592	7,382,346	..	..	..	..	24,651,487	12,011,524
Baltimore,	170,442	82,583	271,301	94,567	1,129,508	624,789	..	..	..	..	1,571,251	801,939

Boston.	5,602	1,801	147,400	43,660	1,608,221	1,015,968	..	..	..	1,761,223	1,061,429
All other ports, . . .	241,283	132,330	23,305	11,820	477,104	281,528	..	..	..	741,638	425,678
Total, 1866. . .	16,803,987	6,472,875	673,477	188,825	33,569,877	18,169,186	..	..	..	50,987,341	24,830,887
Philadelphia.	3,047,117	658,875	117,977	13,989	26,717,294	9,497,274	None.	None.	None.	29,882,388	10,132,138
New York.	4,463,004	1,299,311	15,884	2,854	31,020,482	11,032,154	..	..	..	35,499,370	12,334,319
Baltimore.	157,264	64,499	29,886	3,444	2,485,462	879,197	..	..	..	2,672,612	947,140
Boston.	26,152	11,701	52,581	10,068	1,725,561	789,838	..	..	..	1,804,294	811,667
All other ports. . . .	211,807	71,838	8,248	3,820	175,762	86,720	..	..	..	396,817	162,438
Total, 1867. . .	7,905,344	2,106,284	224,576	34,175	62,125,561	22,267,183	..	..	..	70,255,481	24,407,642
Philadelphia.	3,778,871	622,677	1,144,481	196,915	28,738,410	8,085,771	None.	None.	None.	33,661,762	8,853,363
New York.	5,910,462	811,374	122,545	23,725	35,125,703	10,539,066	..	..	..	41,158,710	11,374,165
Baltimore.	764,121	255,702	20,495	3,847	665,837	183,601	..	..	..	1,451,453	443,150
Boston.	30,939	5,725	220,147	42,546	2,526,803	924,574	..	..	..	2,777,889	972,845
All other ports. . . .	232,840	95,182	9,600	840	164,634	69,131	..	..	..	407,074	165,153
Total, 1868. . .	10,717,233	1,790,660	1,517,268	267,873	67,222,387	19,752,143	..	..	..	79,456,888	21,810,676
Philadelphia.	1,409,603	289,202	2,313,675	384,560	33,037,974	10,397,507	None.	None.	None.	36,761,252	11,071,289
New York.	10,986,193	2,338,777	113,263	21,336	46,890,138	15,529,478	..	..	..	57,989,504	17,889,591
Baltimore.	1,010,661	360,792	..	..	1,179,026	398,379	..	..	..	2,189,687	757,171
Boston.	7,090	969	167,796	27,446	1,946,705	802,782	..	..	..	2,121,591	831,197
All other ports. . . .	12,019	4,664	78,360	12,428	1,349,649	504,896	..	..	..	1,440,028	521,988
Total 1869. . .	13,425,565	2,994,404	2,673,694	445,770	84,403,492	27,631,042	..	..	..	100,502,152	31,071,216
Philadelphia.	3,005,916	608,415	360,054	36,948	36,147,670	11,016,757	None.	None.	None.	39,513,640	11,662,120
New York.	6,573,688	1,364,062	4,802,769	499,540	59,211,486	17,951,557	..	..	..	70,647,943	19,815,159
Baltimore.	656,726	191,146	..	..	857,421	260,974	..	..	..	1,514,147	452,120
Boston.	1,000	500	196,151	27,709	1,436,204	557,291	..	..	..	1,633,355	586,130
All other ports. . . .	165,984	73,169	3,630	667	249,724	76,984	..	..	..	419,338	150,820
Total 1870. . .	10,403,314	2,237,292	5,422,604	564,864	97,902,565	29,864,193	..	..	..	113,728,423	32,646,349

[TABLE RR—Continued.]

	CRUDE PETROLEUM				REFINED PETROLEUM								TOTAL.	
			NAPHTHAS.		ILLUMINATING OILS.		LUBRICATING OILS.		RESIDUUM.					
			Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.				
Philadelphia,	2,588,007	442,944	760,243	73,776	49,428,659	12,266,195	None.	None.	None.	None.	52,776,909	12,782,915		
New York,	6,291,139	1,143,322	6,263,219	648,282	80,346,184	21,005,710	..	..	..	..	92,900,542	22,797,314
Baltimore,	754,365	287,732	..	..	1,074,235	281,173	..	..	..	..	1,828,600	568,905
Boston, . . . . .	..	..	178,602	22,781	1,583,601	529,470	..	..	..	..	1,762,203	552,251
All other ports, . . .	225,527	97,849	7,528	1,958	176,276	56,188	..	..	..	..	409,331	155,995
Total 1871, . . .	9,859,038	1,971,847	7,209,592	746,797	132,608,955	34,138,736	..	..	..	..	149,677,585	36,857,380
Philadelphia,	5,951,735	999,064	1,237,767	156,204	48,763,900	11,566,468	36	45	69,678	6,352	56,023,176	12,728,133		
New York,	7,403,322	1,270,145	6,853,213	775,346	70,097,897	17,970,342	112,175	42,626	266,238	28,603	84,732,845	20,087,062		
Baltimore,	197,339	35,568	185	28	2,104,433	522,278	152,854	56,274	21,000	2,100	2,475,811	616,248		
Boston,	1,700	488	40	20	1,266,951	389,693	258,913	104,677	5,292	495	1,532,896	495,373		
All other ports, . . .	5,612	1,846	1,430	562	306,394	117,327	17,441	7,665	75,978	4,174	406,855	131,574		
Total 1872, . . .	13,559,768	2,307,111	8,092,635	932,160	122,539,575	30,566,108	541,419	211,287	438,186	41,724	145,171,583	34,058,390		
Philadelphia,	4,981,872	821,449	1,686,577	242,852	62,420,325	13,825,920	4,773	1,265	335,262	40,827	69,488,809	14,932,313		
New York,	13,418,635	2,173,588	7,909,918	1,227,547	91,347,338	22,268,003	257,554	103,216	253,344	29,190	113,186,849	25,801,544		
Baltimore, . . . . .	..	..	80,751	7,552	2,611,840	579,309	265,682	93,279	..	..	2,958,273	680,200
Boston, . . . . .	..	..	65,667	9,193	1,434,420	411,472	220,185	79,970	1,050	75	1,721,322	500,710
All other ports, . . .	38,840	15,013	680	295	288,491	110,971	505	236	131,418	9,474	459,934	135,989		
Total 1873, . . .	18,439,407	3,010,059	9,743,593	1,487,439	158,192,414	37,195,735	748,699	277,966	781,074	79,566	187,815,187	47,050,756		

Philadelphia.	4,395,353	473,020	1,533,398	157,612	81,950,259	13,258,005	13,944	2,189	134,400	11,388	88,087,954	13,902,214
New York.	13,367,003	1,624,697	7,898,742	859,104	129,213,255	23,121,039	578,890	188,638	1,382,430	114,174	152,440,320	25,907,672
Baltimore. . . . .	.....	.....	222,603	17,937	3,081,443	504,447	509,169	160,845	69,309	4,538	3,882,515	687,767
Boston. . . . .	.....	.....	1,480	335	2,582,369	554,242	136,746	51,330	.....	.....	2,720,395	605,908
All other ports. . . .	13,463	1,979	21,235	3,633	393,178	123,202	5,566	1,241	241,688	12,199	675,099	142,254
Total 1874.	17,776,419	2,099,696	9,737,457	1,038,622	217,220,504	37,560,955	1,244,305	404,243	1,827,798	142,299	247,806,483	41,245,815
Philadelphia.	3,632,247	324,116	1,830,696	147,018	52,411,429	6,724,172	200	50	304,752	17,353	58,209,324	7,212,709
New York.	11,055,615	1,081,814	9,405,412	948,698	118,825,486	17,507,286	388,545	104,611	2,391,186	166,790	142,066,244	19,809,199
Baltimore. . . . .	.....	.....	400,329	33,717	17,608,320	2,281,732	376,677	82,280	54,180	2,580	18,439,506	2,400,309
Boston. . . . .	.....	.....	81,180	8,118	2,227,142	397,545	400,965	124,119	.....	.....	2,709,288	529,782
All other ports. . . .	252	88	41,323	3,889	479,556	119,628	7,065	2,586	2,730	380	530,946	126,569
Total 1875.	14,718,114	1,406,018	11,758,940	1,141,440	191,551,933	27,030,361	1,173,473	313,646	2,752,848	187,103	221,355,308	30,078,568
Philadelphia.	8,663,564	873,592	3,250,942	294,492	60,770,244	7,958,189	20,968	5,369	278,166	19,736	72,983,914	9,151,378
New York.	10,675,183	1,218,916	11,149,727	1,113,994	111,505,878	16,239,022	462,432	151,068	2,286,564	171,905	136,079,784	18,894,905
Baltimore.	1,178,080	127,353	376,051	33,671	28,728,948	3,709,190	93,660	20,120	8,358	738	30,385,097	3,981,072
Boston. . . . .	.....	.....	480	90	2,110,477	380,159	366,378	119,469	.....	.....	2,477,335	499,718
All other ports. . . .	3,570	407	3,036	564	1,699,126	379,078	19,974	7,837	8,316	827	1,734,022	388,713
Total 1876.	20,620,397	2,220,268	14,780,236	1,442,811	204,814,673	28,755,638	953,442	303,863	2,581,404	193,205	243,650,152	32,915,786
Philadelphia.	4,262,093	558,101	3,499,300	378,412	50,823,652	10,757,806	22,269	6,143	466,368	43,142	59,073,682	11,743,604
New York.	21,127,100	2,988,996	10,915,337	1,363,433	165,327,149	35,017,416	907,456	273,481	2,592,996	259,507	200,870,038	39,902,893
Baltimore.	1,111,617	171,200	633,105	64,224	35,876,575	7,472,443	165,206	41,421	75,684	6,122	37,862,187	7,755,410
Boston. . . . .	.....	.....	87,093	9,145	3,671,122	890,418	440,644	151,823	.....	.....	4,198,839	1,021,386
All other ports. . . .	318,392	38,432	5,348	1,468	6,743,346	1,293,049	65,490	24,672	61,572	8,524	7,194,148	1,366,145
Total 1877.	26,819,202	3,756,729	15,140,183	1,816,682	262,441,844	55,401,132	1,601,065	497,540	3,196,620	317,355	309,198,914	61,789,498
Philadelphia.	4,809,278	471,871	1,994,017	156,796	40,795,553	5,605,117	28,637	8,037	178,878	13,598	47,806,473	6,255,419
New York.	19,347,620	1,911,694	13,986,554	1,224,000	198,134,569	29,001,711	1,475,219	398,536	3,536,866	284,706	236,470,828	32,830,697
Baltimore.	1,803,138	176,816	429,873	29,175	41,740,233	5,529,865	196,124	51,229	.....	.....	44,169,368	5,737,085

[TABLE RR—Continued.]

CRUDE PETROLEUM.				REFINED PETROLEUM.								TOTAL.	
				NAPHTHAS.		ILLUMINATING OILS.		LUBRICATING OILS.		RESIDUUM.			
	Gallons.	Dollars.		Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.
Boston.					737	155		3,841,942	654,758	548,440	162,337		
All other ports. . . .	976,691	133,637		5,330	1,686			4,702,244	712,245	56,144	19,222	263,046	17,783
Total 1878.	26,936,727	2,634,018		16,416,621	1,411,812			289,214,541	41,513,676	2,304,624	639,381	3,908,790	316,087
Philadelphia.	4,687,786	377,197		2,729,037	207,928			76,307,729	7,795,749	7,182	3,367	144,564	7,952
New York.	17,716,883	1,517,701		11,477,029	987,145			206,520,009	23,088,504	1,709,556	452,257	2,684,052	173,563
Baltimore.	1,166,825	98,292		600,782	42,500			32,662,045	3,231,700	293,759	56,249	216,342	12,693
Boston.					52,750	4,623		5,090,871	640,553	478,998	134,903		
All other ports. . . .	2,302,934	187,223		194,763	16,584			11,005,788	1,243,356	22,186	8,692	262,080	16,518
Total 1879.	25,874,488	2,180,413		15,051,361	1,258,780			331,586,442	35,999,862	2,487,681	655,468	3,307,068	210,726
Philadelphia.	2,730,147	160,549		2,366,622	148,464			77,083,630	6,234,708	34,943	6,980	335,094	28,161
New York.	24,034,230	1,632,200		15,257,520	996,398			266,841,227	23,489,496	4,151,597	822,388	3,885,588	217,677
Baltimore.				682,702	36,200			17,921,548	1,399,975	397,240	68,713	416,430	24,000
Boston.	500	65		385	43			4,611,433	507,511	600,837	137,378		
All other ports. . . .	1,533,090	114,393		103,815	11,074			867,985	151,985	8,218	3,665	69,888	6,652
Total 1880.	28,297,997	1,927,207		18,411,044	1,192,229			367,325,823	31,783,575	5,102,835	1,039,124	4,767,000	276,490
Philadelphia.	5,326,528	351,736		1,084,324	95,516			55,076,090	5,480,763	154,836	30,199		
New York.	34,032,428	2,661,708		16,103,509	1,581,154			254,300,615	26,394,965	3,854,572	843,214	3,080,364	175,082
Baltimore.								13,881,990	1,327,989	296,237	50,107	150,528	7,000
Boston.	7,156	687		26,964	2,779			7,808,194	962,437	572,922	128,695	1,386	317
												61,641,778	5,958,214
												311,371,488	31,596,723
												14,298,755	1,385,156
												8,416,612	1,094,915

All other ports. . . .	618,732	51,333	77,523	14,526	1,216,156	211,541	3,636	1,739	15,582	1,412	1,931,629	280,601
Total 1881. . . .	39,984,844	3,065,464	17,292,310	1,693,975	332,283,045	34,317,695	4,852,203	1,034,064	3,247,860	184,411	397,660,262	40,315,609
Philadelphia. . . .	4,454,946	288,581	3,172,703	273,848	116,322,337	9,983,305	704,363	134,443	109,410	7,258	124,823,759	10,697,435
New York.	36,326,586	2,802,955	16,941,538	1,515,809	342,424,705	31,794,515	5,249,902	1,235,846	3,107,328	179,709	404,050,059	37,528,834
Baltimore. . . . .	.....	.....	.....	.....	18,188,946	1,438,189	147,997	24,522	492,828	25,500	18,829,771	1,488,211
Boston. . . . .	.....	.....	13,800	3,081	8,903,437	1,022,455	275,122	76,282	.....	.....	9,192,419	1,101,818
All other ports. . . .	523,465	37,975	84,497	16,405	2,373,008	340,390	70,716	21,303	5,796	335	3,058,582	416,408
Total 1882. . . .	41,304,997	3,129,511	20,213,098	1,809,143	488,213,033	44,588,854	6,508,100	1,492,396	3,715,362	212,802	559,954,590	51,232,706
Philadelphia. . . .	6,939,240	490,857	1,752,328	104,117	65,212,757	5,567,659	963,602	163,720	240,366	15,882	75,128,293	6,312,255
New York.	43,470,118	3,433,182	15,160,531	1,166,332	335,183,035	29,447,160	8,697,040	2,029,199	5,688,236	409,984	410,179,620	36,485,857
Baltimore. . . . .	.....	.....	.....	.....	10,983,808	871,447	95,652	16,098	227,976	15,573	11,307,436	903,118
Boston. . . . .	.....	.....	13,274	3,658	6,115,060	702,539	290,309	73,485	.....	.....	6,418,643	779,742
All other ports. . . .	282,948	20,902	144,404	28,179	2,325,761	337,709	135,739	44,130	8,778	1,207	2,897,630	432,127
Total 1883. . . .	52,712,305	3,914,941	17,070,537	1,302,286	419,821,081	36,926,574	10,182,342	2,326,632	6,145,356	412,646	505,931,622	44,913,079
Philadelphia. . . .	5,557,310	400,833	854,219	49,052	75,919,774	6,985,975	998,373	198,428	176,736	9,050	83,506,412	7,593,338
New York.	61,622,893	4,901,448	14,059,549	999,075	322,108,400	29,514,016	9,065,085	1,858,081	4,470,060	308,512	411,325,987	37,581,132
Baltimore. . . . .	.....	.....	.....	.....	11,076,970	923,946	99,697	16,045	630,882	32,247	11,807,549	972,238
Boston. . . . .	.....	.....	9,084	1,875	4,580,010	536,969	246,290	71,904	10,164	960	4,845,548	611,708
All other ports. . . .	6,126	693	122,559	22,649	1,930,539	284,443	106,090	35,137	9,282	1,910	2,174,596	344,832
Total 1884. . . .	67,186,329	5,302,974	15,045,411	1,072,651	415,615,693	38,195,349	10,515,535	2,179,595	5,297,124	352,679	513,660,092	47,103,248
Philadelphia. . . .	29,542,316	2,082,561	5,726,160	406,263	111,705,564	9,264,065	582,241	90,560	1,278,480	63,137	148,894,761	11,906,586
New York.	51,494,832	3,821,162	9,986,223	844,496	322,795,541	28,603,340	11,782,165	2,394,847	3,881,808	246,383	399,940,569	35,910,228
Baltimore. . . . .	.....	.....	.....	.....	12,728,398	1,007,129	127,623	27,592	1,398,768	64,234	14,254,789	1,098,955
Boston. . . . .	.....	.....	510	141	8,573,089	859,177	409,774	86,832	84	31	8,977,457	946,181
All other ports. . . .	844	110	109,960	21,390	2,440,600	341,116	106,680	33,052	2,520	329	2,600,604	395,997
Total 1885. . . .	81,017,992	5,903,833	15,822,853	1,272,290	458,243,192	40,074,817	13,002,453	2,682,883	6,561,660	374,114	574,688,180	50,257,947

[TABLE RR—Continued.]

REFINED PETROLEUM.													
CRUDE PETROLEUM.				NAPHTHAS.		ILLUMINATING OILS.		LUBRICATING OILS.		RESIDUUM.		TOTAL.	
	Gallons.	Dollars.		Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.
Philadelphia.	33,452,742	2,327,344		4,866,220	344,925	116,126,657	9,628,165	288,465	43,445	810,042	52,480	155,574,126	12,396,359
New York.	46,545,119	3,513,491		7,236,729	618,636	329,092,679	28,768,562	11,712,072	2,345,527	1,131,000	72,586	395,720,599	35,318,832
Baltimore.	25,995	1,626				11,144,211	822,052	35,133	7,402	1,249,458	63,528	12,454,797	894,608
Boston.	10,000	830		3,280	680	7,568,087	771,394	152,486	35,946			7,733,853	808,850
All other ports.	212,907	16,286		204,968	33,179	5,539,817	644,128	337,913	87,295	2,772	307	6,298,377	781,195
Total, 1886.	80,246,763	5,859,577		12,311,197	997,420	469,471,451	40,634,331	12,526,069	2,519,615	3,226,272	188,901	577,781,752	50,199,844
Philadelphia.	35,892,185	2,204,847		4,945,780	393,632	113,459,691	8,566,164	276,858	38,539	1,445,430	68,924	156,519,944	11,272,106
New York.	40,162,009	2,654,894		10,690,102	964,645	332,372,082	25,970,393	16,162,890	3,003,103	1,101,450	55,268	400,488,533	32,648,303
Baltimore.	5,075					11,607,138	828,016	113,986	11,299	701,946	32,387	12,428,145	871,952
Boston.				6,763	2,065	6,414,154	596,404	157,310	32,654			6,658,227	631,113
All other ports.	3,609			92,594	10,325	16,412,746	1,343,020	199,469	47,705			16,708,418	1,401,441
Total, 1887.	76,062,878	4,860,382		15,735,239	1,370,657	480,845,811	37,303,997	16,910,513	3,133,300	3,248,826	156,579	592,803,267	46,824,915
Philadelphia.	39,908,874	2,530,308		5,084,609	378,773	99,698,916	7,825,976	1,607,476	112,671	371,742	16,220	146,671,617	10,863,948
New York.	45,517,847	3,238,053		6,943,325	607,800	320,197,058	25,466,617	20,813,863	3,758,841	808,038	52,654	394,280,131	33,123,965
Baltimore.						8,411,269	602,722	85,135	12,620	188,244	8,314	8,684,648	623,656
Boston.				5,563	1,004	5,178,583	402,757	181,093	35,913			5,365,239	439,674
All other ports.	112,004	13,647		33,424	4,704	23,001,395	1,917,338	201,962	55,332	2,218	145	23,350,003	1,991,166
Total, 1888.	85,538,725	5,782,008		12,066,921	992,281	456,487,221	36,215,410	22,889,529	3,975,377	1,369,242	77,333	578,351,638	47,042,409

Philadelphia.	30,440,884	1,974,204	3,075,576	270,359	109,672,408	8,171,091	2,032,819	188,435	163,800	11,629	145,985,487	10,615,718
New York.	42,089,455	3,070,941	10,498,895	882,451	354,378,595	28,083,946	22,305,022	3,940,235	1,314,558	72,383	430,496,525	36,049,956
Baltimore. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	6,521,873	452,637	454,343	55,573	176,820	9,595	7,153,036	517,805
Boston. . . . .	. . . . .	. . . . .	2,305	739	6,271,544	579,557	156,017	42,918	. . . . .	. . . . .	6,439,866	623,205
All other ports.	457,044	37,987	13,278	2,163	25,413,035	1,999,102	208,712	64,859	28,476	2,882	26,120,545	2,106,993
Total, 1889.	72,987,383	5,083,132	14,100,054	1,155,703	502,257,455	39,286,333	25,166,913	4,292,020	1,683,654	96,489	616,195,459	49,913,677
Philadelphia.	45,039,903	2,803,070	2,289,679	181,538	114,109,930	7,923,110	1,658,044	168,284	4,200	202	163,101,756	11,076,204
New York.	48,962,415	3,816,964	10,584,502	945,736	376,866,986	28,315,297	27,408,824	4,371,976	2,308,050	107,169	466,190,777	37,557,142
Baltimore. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	10,963,213	545,177	829,482	145,454	272,150	12,580	12,637,845	703,211
Boston. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	4,135,377	424,164	134,480	30,170	. . . . .	. . . . .	4,269,757	454,334
All other ports.	1,448,335	124,201	63,252	7,525	17,219,684	1,432,890	158,692	47,463	1,400	119	18,891,363	1,612,198
Total, 1890.	95,450,653	6,744,235	12,937,433	1,134,799	523,295,090	38,640,638	30,162,522	4,763,347	2,645,800	130,070	664,491,438	51,403,089
Philadelphia.	45,307,725	2,522,317	1,697,869	126,704	138,228,597	8,480,211	4,906,068	519,758	100,800	6,397	190,241,459	11,655,387
New York.	44,597,938	3,224,736	10,392,532	857,656	396,106,898	29,069,504	27,458,217	4,137,554	1,499,100	55,830	480,054,685	37,345,290
Baltimore. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	14,709,063	739,405	821,024	107,158	259,050	10,734	15,789,077	857,297
Boston. . . . .	. . . . .	. . . . .	180	25	2,944,646	276,249	96,142	26,762	1,450	64	3,042,418	303,100
All other ports.	1,509,432	129,399	80,566	8,661	19,130,261	1,655,832	233,279	67,371	42,900	4,397	20,936,438	1,865,600
Total, 1891.	91,415,095	5,876,452	12,171,147	993,056	571,119,805	40,221,201	33,514,730	4,858,603	1,903,300	77,422	710,124,077	52,026,734
Philadelphia.	65,898,042	2,908,987	508,102	31,390	157,969,213	8,126,972	6,735,902	735,938	150	25	231,111,409	11,803,312
New York.	35,380,720	2,074,140	12,072,985	871,117	373,684,786	23,323,186	25,248,954	4,225,517	581,300	38,581	446,968,745	30,532,541
Baltimore. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	10,615,959	417,810	1,091,105	139,515	. . . . .	. . . . .	11,707,064	557,325
Boston. . . . .	. . . . .	. . . . .	2,000	478	2,103,332	176,566	188,220	34,542	5,800	444	2,299,352	212,030
All other ports.	2,314,005	118,713	144,891	9,936	20,523,568	1,496,690	326,895	67,838	76,250	7,607	23,385,409	1,700,784
Total, 1892.	103,592,767	5,101,840	12,727,978	912,921	564,896,658	33,541,224	33,591,076	5,203,350	663,500	46,657	715,471,979	44,805,992

[TABLE SS.]
 PETROLEUM EXPORTS BY GRADES, EACH YEAR, FROM JULY 1, 1863, TO JUNE 30, 1892.

YEAR ENDING JUNE 30.	CRUDE.		NAPHTHA.		ILLUMINATING.		LUBRICATING.		RESIDUUM.		TOTAL.	
	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.
1864.	9,980,654	3,894,187	438,197	154,091	12,791,518	6,764,411	. . . . .	. . . . .	. . . . .	. . . . .	23,210,369	10,782,689
1865.	12,253,897	6,868,513	480,947	173,943	12,722,005	9,520,957	. . . . .	. . . . .	. . . . .	. . . . .	25,496,849	16,562,413
1866.	16,037,943	6,015,921	673,477	188,825	34,255,921	18,626,141	. . . . .	. . . . .	. . . . .	. . . . .	50,987,341	24,830,887
1867.	7,344,248	1,894,001	224,576	34,175	62,686,657	22,509,406	. . . . .	. . . . .	. . . . .	. . . . .	70,255,581	24,407,642
1868.	10,029,659	1,564,933	1,517,268	267,873	67,909,961	19,977,870	. . . . .	. . . . .	. . . . .	. . . . .	79,456,888	21,810,676
1869.	13,425,566	2,994,404	2,673,094	445,770	84,403,492	27,636,137	. . . . .	. . . . .	. . . . .	. . . . .	100,636,684	31,127,433
1870.	10,403,314	2,237,292	5,422,604	564,864	97,902,505	29,864,193	. . . . .	. . . . .	. . . . .	. . . . .	113,735,294	32,668,960
1871.	9,859,038	1,971,847	7,209,592	746,797	132,608,955	34,138,736	6,871	2,611	135,474	14,770	149,892,691	36,894,810
1872.	13,569,768	2,307,111	8,092,635	932,160	122,539,575	30,566,108	59,632	22,660	438,186	41,724	145,171,583	34,058,390
1873.	18,439,407	3,010,050	9,743,593	1,487,439	158,102,414	37,195,735	541,419	211,287	781,074	79,566	187,815,187	42,050,756
1874.	17,776,419	2,099,696	9,737,457	1,038,622	217,220,504	37,500,995	748,699	277,966	1,827,768	142,239	247,806,483	41,245,815
1875.	14,718,114	1,406,018	11,758,940	1,141,440	191,551,933	27,030,361	1,244,305	404,243	2,752,848	187,103	221,955,308	30,078,568
1876.	20,520,397	2,220,268	14,780,236	1,442,811	204,814,673	28,755,638	1,173,473	313,646	1,581,401	193,206	243,680,152	32,915,786
1877.	26,819,292	3,756,729	15,140,183	1,816,682	262,441,844	55,401,132	963,442	497,540	3,196,620	317,355	309,198,914	61,789,438
1878.	26,936,727	2,694,018	16,416,621	1,411,812	289,214,541	41,513,676	1,601,065	639,381	3,968,790	316,087	338,841,303	46,574,974
1879.	25,874,488	2,180,413	15,054,361	1,268,780	331,586,442	35,999,862	2,487,681	655,468	3,307,068	210,726	378,310,010	40,305,249
1880.	28,297,997	1,927,207	18,411,044	1,192,229	367,325,823	31,733,575	5,162,835	1,039,124	4,707,000	276,490	423,964,639	36,218,625
1881.	39,984,844	3,065,464	17,292,310	1,693,975	332,283,045	34,317,695	4,852,203	1,054,064	3,247,860	184,411	397,680,262	40,315,639
1882.	41,304,997	3,129,511	20,313,068	1,809,143	488,213,033	44,588,854	5,508,100	1,492,396	3,716,362	212,802	559,954,590	51,232,706
1883.	52,712,306	3,914,941	17,070,537	1,302,286	419,821,081	36,926,574	10,182,342	2,326,632	6,145,356	442,646	505,481,622	44,913,079

1884.	67,186,329	5,302,974	15,045,411	1,072,651	415,615,633	38,195,349	10,515,535	2,179,595	5,297,124	352,679	513,660,092	47,103,248
1885.	81,037,992	5,903,833	15,822,853	1,272,290	458,243,192	40,074,827	13,002,453	2,632,853	6,561,650	374,114	574,628,180	50,257,947
1886.	80,246,763	5,859,577	12,311,197	997,420	469,471,451	40,634,331	12,526,069	2,519,615	3,226,272	188,901	577,781,752	50,199,844
1887.	76,092,878	4,860,382	15,735,239	1,370,675	480,845,811	37,303,997	16,910,513	3,133,300	3,248,826	156,579	592,803,267	46,824,333
1888.	85,538,725	5,782,008	12,066,921	992,281	456,487,221	36,215,410	22,889,529	3,975,377	1,369,242	77,333	578,351,638	47,042,409
1889.	72,987,383	5,083,132	14,100,054	1,155,703	502,237,455	39,286,333	25,166,913	4,292,020	1,683,654	96,489	616,195,459	49,913,677
1890.	95,450,653	6,744,235	12,937,433	1,134,799	523,295,090	38,640,638	30,162,522	4,703,347	2,645,800	120,070	664,491,498	51,403,089
1891.	91,415,095	5,876,452	12,171,147	993,056	571,119,805	40,221,201	33,514,730	4,858,603	1,903,300	77,422	710,124,077	52,026,734
1892.	103,592,767	5,101,840	12,727,978	912,921	564,896,638	33,541,224	33,591,076	5,203,350	663,500	46,657	715,471,979	44,805,992

[TABLE TT.]
 PETROLEUM EXPORTS FROM PHILADELPHIA, SHOWING QUANTITIES AND VALUES OF EACH GRADE, FROM JULY 1, 1863, TO
 JUNE 30, 1892.

YEAR ENDING JUNE 30.	CRUDE PETROLEUM,		NAPHTHAS.		ILLUMINATING OILS.		LUBRICATING OILS.		RESIDUUM.		TOTAL.	
	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.
1864.	2,087,114	670,774	18,167	4,842	2,878,148	1,413,397	None.	None.	None.	None.	4,983,429	2,089,213
1865.	1,110,907	488,751	43,992	9,640	3,886,019	2,704,960	"	"	"	"	5,040,918	3,203,351
1866.	5,096,037	1,639,991	164,198	25,771	16,701,452	8,861,555	"	"	"	"	21,961,687	10,530,317
1867.	3,047,117	658,875	117,977	13,989	26,717,294	9,479,274	"	"	"	"	29,882,388	10,152,138
1868.	3,778,871	622,877	1,144,481	196,915	28,738,410	8,065,771	"	"	"	"	33,661,762	8,855,363
1869.	1,409,603	289,202	2,313,675	384,560	33,037,374	10,397,507	"	"	"	"	36,761,252	11,071,269
1870.	3,005,916	608,415	360,054	36,948	36,147,670	11,016,757	"	"	"	"	39,513,640	11,662,120
1871.	2,588,007	442,944	760,243	73,776	49,428,659	12,266,195	"	"	"	"	52,776,909	12,782,915
1872.	5,951,795	999,064	1,237,767	156,204	48,763,900	11,566,468	36	45	69,673	6,352	56,023,176	12,738,133
1873.	4,981,872	821,449	1,686,577	242,852	62,420,325	13,823,920	4,773	1,265	395,292	40,827	69,488,809	14,932,313
1874.	4,395,953	473,020	1,593,398	157,612	81,950,259	13,258,005	13,944	2,189	134,400	11,388	88,087,954	13,902,214
1875.	3,662,247	324,116	1,830,396	147,018	52,411,429	6,724,172	200	50	304,752	17,353	58,209,324	7,212,709
1876.	8,663,564	873,592	3,250,942	294,492	60,770,244	7,958,189	20,968	5,369	278,166	19,736	72,983,914	9,151,378
1877.	1,252,093	558,101	3,499,300	378,412	50,823,652	10,757,806	22,269	6,143	466,368	43,142	59,073,682	11,743,604
1878.	4,809,278	471,871	1,994,067	156,796	40,795,553	5,005,117	28,197	8,037	178,878	13,598	47,806,473	6,255,419
1879.	4,687,786	377,197	2,729,037	207,928	76,307,729	7,795,749	7,182	3,367	144,564	7,952	83,876,298	8,392,193
1880.	2,750,147	160,549	2,366,622	148,464	77,083,630	6,234,608	34,943	6,980	395,094	28,161	82,610,936	6,578,762

1881.	5,326,528	351,736	1,084,324	95,516	55,076,090	5,490,763	154,886	30,139	.....	61,641,778	5,958,214
1882.	4,454,946	288,581	3,172,703	273,848	116,322,337	9,993,305	764,363	134,443	.....	124,823,759	10,697,435
1883.	6,959,240	460,857	1,752,328	104,117	65,212,757	5,567,659	963,602	163,720	.....	75,128,293	6,312,235
1884.	5,557,310	400,833	854,219	49,052	75,919,774	6,935,975	998,373	198,428	.....	83,506,412	7,593,338
1885.	29,542,316	2,082,561	5,725,160	406,263	111,705,564	9,264,065	582,241	90,560	.....	148,834,761	11,906,586
1886.	33,452,742	2,327,344	4,866,220	344,925	116,126,657	9,628,165	288,465	43,445	.....	155,574,126	12,396,359
1887.	35,892,185	2,204,847	4,945,780	333,632	113,950,691	8,566,164	276,858	38,539	.....	156,519,944	11,272,106
1888.	39,908,874	2,530,308	5,084,009	378,773	99,636,916	7,825,976	1,607,476	112,671	.....	146,671,617	10,863,948
1889.	30,440,884	1,974,204	3,675,576	270,359	109,672,408	8,171,091	2,032,819	188,435	.....	145,985,487	10,615,718
1890.	45,039,903	2,803,070	2,289,679	181,538	114,109,930	7,923,110	1,658,044	168,284	.....	163,101,756	11,076,204
1891.	45,307,725	2,522,517	1,607,869	126,704	138,228,997	8,480,211	4,906,068	519,758	.....	190,241,459	11,655,387
1892.	65,898,042	2,908,987	508,102	31,300	157,969,213	8,126,972	6,735,902	735,938	.....	231,111,409	11,803,312

[TABLE UU.]—EXPORTS OF PARAFFINE AND PARAFFINE WAX, FROM JULY 1, 1880, TO JUNE 30, 1892.

(Compiled from data United States Treasury Department.)

YEAR ENDING JUNE 30.	Pounds.	Dollars.
1881,	5,369,821	437,187
1882,	9,121,161	579,131
1883,	14,228,551	936,885
1884,	17,089,817	1,263,197
1885,	24,378,488	1,725,344
1886,	24,289,693	1,729,313
1887,	31,546,223	2,032,713
1888,	36,005,522	2,168,247
1889,	33,826,575	2,029,602
1890,	48,516,551	2,408,709
1891,	66,366,003	3,714,649
1892,	64,998,867	3,965,263

[TABLE VV.]

AVERAGE MONTHLY AND YEARLY EXPORT PRICES OF CRUDE OIL PER GALLON, IN BARRELS, AT NEW YORK, FROM JANUARY 1, 1863, TO DECEMBER 31, 1892.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
1863 *	\$0 24	\$0 23	\$0 22	\$0 21½	\$0 26½	\$0 27½	\$0 30½	\$0 35½	\$0 36	\$0 33½	\$0 28½	\$0 30½	\$0 28½
1864.	31½	30½	31½	37½	38½	44½	52½	52½	45½	41½	45½	51½	41½
1865.	49½	47½	37	35½	36	34½	32½	32	35½	38½	38½	41½	38½
1866.	34½	30	25½	24½	27½	25½	22½	26½	20½	23½	22½	19½	25½
1867.	13½	12½	11½	11	10½	8½	13	12½	14½	14½	12½	10½	12½
1868.	16½	17	17½	16½	18½	19½	22½	21½	20½	21½	21½	23½	19½
1869.	24½	26	22½	22½	21½	21½	23	23	33	23½	25½	21½	23½
1870.	21½	21½	19½	19½	19½	18½	17½	16½	17½	16½	16½	16½	18½
1871.	18½	18½	18½	17½	18½	19½	18½	17½	18	18	16½	17½	18½
1872.	16½	16½	16½	15½	16½	16½	15½	14½	15½	17½	17½	15½	16½
1873.	12½	11½	11½	12½	12½	11½	10½	9½	8½	8½	8½	8½	10½
1874.	6	7½	7	7½	6	5½	5	5½	5½	5½	5½	5½	6
1875.	6½	7½	7½	6½	6½	6½	5½	5½	6	6½	6½	7½	6½
1876.	8	8½	8½	8½	8½	8½	9½	11½	14½	13½	12½	15½	10½
1877.	14½	11	10½	10½	8½	7½	7	7½	7½	8½	8	8	9½
1878.	7	7½	7½	6½	7½	7½	6½	6½	5½	5½	5½	.....	7½
1879.	.....	.....	5½	5	4½	3½	2½	2½	2½	3½	3½	.....	3½
1880.	6½	6½	6½	6½	6½	6½	7	6½	6½	6½	6½	6½	6½
1881.	6½	7	6½	5½	5½	6½	6½	6½	7	6½	6½	6½	6½

* In bulk.

[TABLE VV—Concluded]

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
1882.	\$0 63	\$0 63	\$0 63	\$0 63	\$0 63	\$0 63	\$0 9	\$0 63	\$0 63	\$0 63	\$0 74	\$0 73	\$0 63
1883.	63	63	7	42	63	63	63	63	71	71	71	71	71
1884.	74	71	84	31	71	63	63	63	63	63	63	63	7
1885.	49	63	7	39	63	63	71	71	71	71	71	63	63
1886.	49	63	39	49	49	9	9	9	53	49	49	49	49
1887.	49	9	53	9	45	45	45	45	53	9	49	49	53
1888.	49	49	39	49	49	49	49	49	63	63	63	63	63
1889.	61	63	63	63	63	63	63	7	7	7	74	71	63
1890.	71	71	71	71	71	71	71	71	71	71	74	7	71
1891.	71	71	7	41	64	63	61	63	54	53	51	53	61
1892.	51	53	53	53	53	45	53	53	54	53	53	53	53

[TABLE XX.]

AVERAGE MONTHLY AND YEARLY EXPORT PRICES OF REFINED OIL, PER GALLON, IN BARRELS, AT NEW YORK, FROM JANUARY 1, 1861, TO DECEMBER 31, 1892.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Yearly.
1861.	\$0 78½	\$0 79½	\$0 72½	\$0 66½	\$0 62½	\$0 59	\$0 50½	\$0 58½	\$0 58	\$0 55	\$0 48½	\$0 48½	\$0 61½
1862.	40	32½	30	27½	25	26½	30	34	34½	36½	60½	59½	36½
1863.	40	38½	34½	33½	39½	44½	49	53½	57½	52½	41½	45½	44½
1864.	46½	47½	49½	54½	59½	68½	86½	84½	75	64	68½	72½	65
1865.	70	67½	58½	52½	51½	51½	52½	52	58½	61½	62½	65½	58½
1866.	57½	48½	41½	40½	43	41½	39½	44½	44½	40½	35½	31½	42½
1867.	28½	28½	27½	27½	26½	21½	30½	29½	34½	34½	28	23½	28½
1868.	24½	25	25½	26½	29½	31½	34½	33	31	30	30½	32½	29½
1869.	34½	36½	32½	32½	31½	31	32½	32½	32½	32½	34	31½	32½
1870.	31½	29½	27	26½	27½	27	26	25	26½	24½	23	23	26½
1871.	24½	25½	24½	23½	24½	25½	25½	21½	24½	23½	22½	23	24½
1872.	22½	21½	22½	21½	23½	23	22½	22½	24½	26	27	26	23½
1873.	22½	19½	19	20	19½	19	18½	16½	16½	16½	14½	13½	17½
1874.	13½	15	14½	15½	13½	12½	12½	11½	12½	11½	10½	11½	13
1875.	12½	14	15	13½	12½	12½	11½	11½	12½	14½	13	12½	13
1876.	14½	14½	14½	14	14½	14½	16½	19½	26	26	26½	29½	19½
1877.	24	18½	16	15½	14½	13½	13½	13½	14½	14½	13½	13½	15½
1878.	12½	12½	11½	11½	11½	11½	10½	10½	10½	9½	9½	8½	10½
1879.	9	9½	9½	9½	8½	7½	7½	6½	6½	7½	8½	8½	8½

[TABLE XX—Concluded.]

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Yearly.
1880,	\$0 20 08	\$0 20 08	\$0 20 48	\$0 20 88	\$0 20 88	\$0 20 88	\$0 20 88	\$0 20 88	\$0 10 88	\$0 11 08	\$0 10 08	\$0 10 08	\$0 08
1881,	88	96	88	77	88	88	77	77	8	77	77	7	8
1882,	7	82	77	88	77	77	67	67	77	77	87	77	77
1883,	77	77	8	87	77	77	77	77	86	88	88	97	8
1884,	92	87	88	87	88	77	77	77	77	77	77	77	87
1885,	7	77	77	77	77	77	87	88	88	88	88	77	8
1886,	87	77	77	77	77	77	7	67	67	67	7	67	7
1887,	67	67	67	67	67	67	67	67	67	67	7	77	67
1888,	77	77	77	77	77	77	77	77	77	77	77	77	77
1889,	7	77	7	67	67	67	77	77	77	77	77	77	77
1890,	77	77	77	77	77	77	77	77	78	77	77	77	78
1891,	78	77	77	77	77	77	7	67	67	67	67	67	67
1892,	67	67	67	67	6	6	9	67	67	6	57	57	6

[TABLE YY.]—TABLE SHOWING THE CORRESPONDING REAL SPECIFIC GRAVITY AND WEIGHT OF ONE GALLON OF REFINED OIL AT 60° TEMPERATURE, FOR EACH DEGREE OF THE BAUME' SCALE.

BAUME' SCALE.	SPECIFIC GRAVITY.	WEIGHT OF ONE GALLON.	BAUME' SCALE.	SPECIFIC GRAVITY.	WEIGHT OF ONE GALLON.
<i>Degree.</i>	<i>Degree.</i>	<i>Pounds.</i>	<i>Degree.</i>	<i>Degree.</i>	<i>Pounds.</i>
10,	1.0000	8.331	50, . . . . .	.7777	6.493
11, . . . . .	.9929	8.273	51, . . . . .	.7734	6.458
12, . . . . .	.9859	8.215	52, . . . . .	.7692	6.424
13, . . . . .	.9790	8.157	53, . . . . .	.7650	6.390
14, . . . . .	.9722	8.099	54, . . . . .	.7608	6.355
15, . . . . .	.9655	8.046	55, . . . . .	.7567	6.321
16, . . . . .	.9589	7.993	56, . . . . .	.7526	6.287
17, . . . . .	.9523	7.939	57, . . . . .	.7486	6.255
18, . . . . .	.9459	7.886	58, . . . . .	.7446	6.223
19, . . . . .	.9395	7.833	59, . . . . .	.7407	6.192
20, . . . . .	.9333	7.780	60, . . . . .	.7368	6.160
21, . . . . .	.9271	7.731	61, . . . . .	.7329	6.129
22, . . . . .	.9210	7.683	62, . . . . .	.7290	6.097
23, . . . . .	.9150	7.634	63, . . . . .	.7253	6.066
24, . . . . .	.9090	7.585	64, . . . . .	.7216	6.034
25, . . . . .	.9032	7.537	65, . . . . .	.7179	6.002
26, . . . . .	.8974	7.489	66, . . . . .	.7142	5.972
27, . . . . .	.8917	7.440	67, . . . . .	.7106	5.943
28, . . . . .	.8860	7.391	68, . . . . .	.7070	5.913
29, . . . . .	.8805	7.343	69, . . . . .	.7035	5.883
30, . . . . .	.8750	7.294	70, . . . . .	.7000	5.853
31, . . . . .	.8695	7.249	71, . . . . .	.6965	5.823
32, . . . . .	.8641	7.206	72, . . . . .	.6930	5.795
33, . . . . .	.8588	7.162	73, . . . . .	.6896	5.768
34, . . . . .	.8536	7.118	74, . . . . .	.6863	5.739
35, . . . . .	.8484	7.075	75, . . . . .	.6829	5.711
36, . . . . .	.8433	7.034	76, . . . . .	.6796	5.684
37, . . . . .	.8383	6.994	77, . . . . .	.6763	5.656
38, . . . . .	.8333	6.953	78, . . . . .	.6730	5.628
39, . . . . .	.8284	6.914	79, . . . . .	.6698	5.600
40, . . . . .	.8235	6.874	80, . . . . .	.6666	5.573
41, . . . . .	.8187	6.835	81, . . . . .	.6635	5.545
42, . . . . .	.8139	6.796	82, . . . . .	.6604	5.514
43, . . . . .	.8092	6.756	83, . . . . .	.6573	5.484
44, . . . . .	.8045	6.717	84, . . . . .	.6542	5.454
45, . . . . .	.8000	6.679	85, . . . . .	.6511	5.424
46, . . . . .	.7954	6.641	86, . . . . .	.6481	5.399
47, . . . . .	.7909	6.604	87, . . . . .	.6451	5.374
48, . . . . .	.7865	6.567	88, . . . . .	.6422	5.350
49, . . . . .	.7821	6.530	89, . . . . .	.6392	5.325
			90, . . . . .	.6363	5.301

BIBLIOGRAPHY OF PETROLEUM.

It is not our purpose to attempt to give a complete list of the books and articles on petroleum and its manufacture. Were it possible to prepare such a catalogue, space could not be spared to print it. We append simply the titles of the books and articles that, directly or indirectly, have been of assistance in the preparation of this report:

- Sagard, *Histoire du Canada*, 1632
 Massachusetts Magazine, i, 416, Oil Springs of Pennsylvania, . . 1789
 Dr. S. P. Hildreth, Observations on the Saliferous Rock Formation
 of the Ohio (*Silliman's Journal*), 1833
 Benjamin Silliman, Fountain of Petroleum called the Oil Spring
 (*Silliman's Journal*), 1833
 Dr. S. P. Hildreth, Bituminous Coal Deposits of the Valley of the
 Ohio (*Silliman's Journal*), 1836
 Selligue, Huile Provenant de Schistes Bitumineux Employée avec
 Succès contre la Gale (*Comptes-Rendus des Séances de l'Académie
 Française*), 1839
 E. Hitchcock, Dead Sea Asphalt (Report of Association of Geolo-
 gists), 1841
 G. T. Vigne, Travels in Kashmir and Little Thibet, 1842
 B. Silliman, Jr., Report on the Rock Oil or Petroleum from Venango
 County, Pennsylvania, 1855
 James Young, Improvements in Treating certain Bituminous Sub-
 stances, etc. (*Journal Franklin Institute*), 1855
 H. D. Rogers, Petroleum (Geology of Pennsylvania), 1858
 J. S. Newberry, Rock Oils of Ohio (*Ohio Agricultural Report*), . . 1859
 J. S. Newberry, Oil Wells of Mecca (*Canadian Naturalist*), . . . 1860
 F. H. Storer, Manufacture of Paraffine Oils (*American Journal of
 Science and Arts*), 1860
 W. H. Whitmore, Results of Destructive Distillation of Bituminous
 Substances, 1860
 Abraham Gessner, Practical Treatise on Coal, Petroleum and other
 Distilled Oils, 1861
 T. S. Hunt, History of Petroleum or Rock Oil (Report Smithsonian
 Institute), 1862
 J. P. Lesley, Coal Oil (Report to Commissioner of Agriculture,) . 1862
 A. Norman Tate, Explosibility of Petroleum Oil (*Pharmaceutical
 Journal, London*), 1862
 Thomas S. Ridgway, Oil District of Oil Creek in the State of Penn-
 sylvania (*Journal of the Franklin Institute*), 1863
 H. D. Rogers, Coal and Petroleum (*Harper's Magazine*), 1863
 J. D. Dana, Manual of Geology, 1864

B. Franklin, After Petroleum (Harper's Magazine),	1864
A. Norman Tate, Petroleum and its Derivatives,	1864
J. H. A. Bone, Petroleum and Petroleum Wells,	1865
R. Briggs, Venango County Oil Region (Proceedings of the American Philosophical Society,)	1865
Draper and Pease, History of Petroleum (Scientific American), . .	1865
J. P. Lesley, Petroleum of Kentucky and Records of Borings in Pennsylvania (Proceedings of the American Philosophical Society),	1865
H. Erni, Coal, Oil and Petroleum,	1865
Abraham Gessner, Treatise on Coal, Petroleum and other Oils (Second Edition),	1865
J. P. Lesley, Record of Oil Boring (Proceedings of the American Philosophical Society),	1865
J. S. Schooley, Petroleum Region of America (Harper's Magazine),	1865
C. M. Warren, On a Process of Fractional Condensation (Memoirs American Academy of Arts and Sciences),	1865
C. M. Warren, Researches on the Volatile Hydrocarbons (Memoirs American Academy of Arts and Sciences),	1865
Warren and Storer, Researches on the Volatile Hydrocarbons (Memoirs American Academy of Arts and Sciences),	1865
William Wright, Oil Regions of Pennsylvania,	1865
Berthelot, Sur L'Origine des Carbuers et des Combustibles Mineraux (Annales de Chimie et de Physique),	1866
Henry J. Bigelow, Rhigolene, a Petroleum Naphtha for Producing Anesthesia by freezing (Boston Medical and Surgical Journal), .	1866
S. J. M. Eaton, Petroleum,	1866
S. S. Hays, Report on Petroleum (39th Congress ex-Doc. 51), . .	1866
E. Atkinson, Synthetical Researches on the Hydrocarbons (Philosophical Magazine),	1867
C. H. Hitchcock, Petroleum in North America (Geo. Magazine), .	1867
C. M. Warren, Hydrocarbons of Pennsylvania Petroleum (American Journal of Science and Arts),	1868
S. F. Peckham, Distillation of Hydrocarbons at High Temperatures (American Journal of Science and Arts),	1869
A. Norman Tate, Examination of Petroleum According to the act of 1868,	1869
C. F. Chandler, Report on the Quality of Oil Sold in the Metropolitan District,	1870
Cone and Johns, Petrolia,	1870
C. F. Chandler, Petroleum as an Illuminator (Report Health Department, New York),	1870
M. C. Cook, Naphtha (Journal of the Society of Arts),	1871
R. MacLagan, Geographical Distribution of Petroleum (Proceedings British Association for Advancement of Science),	1871

J. P. Lesley, Record of Fourteen Wells at Brady's Bend (Proceedings of the American Philosophical Society),	1872
J. G. Henry, Early and Later History of Petroleum,	1873
F. Field, The Paraffine Industry (American Chemist),	1874
F. A. Abel, Accidental Explosions (Proceedings of the Royal Institution),	1875
W. H. Chesebrough, Vaseline (Wagner's Berichte),	1875
C. Cunningham, Manufacture of Oil Stills (American Journal of Gaslighting),	1875
H. E. Wrigley, Petroleum Region of Western Pennsylvania (Second Geological Survey),	1875
J. F. Carll, Oil Well Records (Proceedings of American Philosophical Society),	1876
C. F. Chandler, Statistics of Petroleum in the United States (American Chemist),	1876
J. P. Hale, Description of First Artesian Well of 1809 for Prof. M. F. Maury's Report on Industries of West Virginia,	1876
F. A. Abel, Report on Testing Petroleum,	1877
C. A. Ashburner, Oil Well Records in Bradford Oil Region (American Journal of Science and Arts),	1878
C. A. Ashburner, Oil Well Records in McKean and Elk Counties (Proceedings of the American Philosophical Society),	1878
C. A. Ashburner, Oil Sands of Pennsylvania (Journal of the Franklin Institute),	1878
R. H. Thurston, Friction and Lubrication,	1879
C. A. Ashburner, Petroleum (American Journal of Science and Arts),	1880
C. J. H. Woodbury, Friction of Lubricating Oil (Transactions American Society Mechanical Engineers),	1880
J. F. Carll, Geology of the Oil Regions (Second Geological Survey),	1880
Manual of Petroleum,	1883
A. N. Leet, Petroleum Distillation,	1884
S. F. Peckham, Report on Petroleum for Tenth United States Census,	1885
Boverton Redwood, Petroleum,	1887
B. J. Crew, Practical Treatise on Petroleum,	1887
G. H. Little, Marine Transport of Petroleum,	1890
J. D. Weeks, Petroleum (United States Geological Survey),	1890
J. D. Weeks, Petroleum (United States Geological Survey),	1892
J. D. Weeks, Report on Petroleum for the Eleventh United States Census,	1893

THE STRIKES DURING 1892.

There were only twenty-six strikes during the year, a much smaller number than usual. Of these, one was by the employes of a railway company; thirteen by the employes engaged in iron and steel industries; two by employes in cigar manufactories; four by employes in textile manufactories; there was one strike in a brewery; one in a coo-erage works; two in tile works, and a lockout by coal operators. Eleven of these strikes occurred in Philadelphia, and four in Pittsburg. The whole number of persons engaged in the strikes was 4,208, and the number involved 7,414. Only three strikes succeeded; four partly so, while the others failed. The total loss incurred by the employes was \$373,246; and the employers' loss, so far as ascertained, was \$50,985. The above summary does not include any statistics of the Carnegie Steel Company strike, as this will be separately described.

Not only were the strikes few in number, but most of them were of short duration, except the strike at the Homestead Steel Works, belonging to the Carnegie Steel Company. Of this strike a fuller record is necessary, especially of the causes and consequences, but not all the details, as these were given in the newspapers, and doubtless are still fresh in the minds of many.

The Carnegie Steel Company owns and operates several plants. These are the Edgar Thomson furnaces at Bessemer, the Edgar Thomson Steel Works at Braddock, near Bessemer, the Duquesne Steel Works at Duquesne, the Lucy Furnaces, the Keystone Bridge Works, the Upper Union Mills and the Lower Union Mills in Pittsburg, the Beaver Falls Mills, the Scotia Ore Mines, the Larimer Coke Works, the Allegheny Coke Works, and the Homestead Steel Works. All of them are in Pennsylvania, and nearly all are in or adjacent to the city of Pittsburg. The capital of the corporation is \$25,000,000, and the total number of employes is 13,000 men. The Homestead Steel Works, which was the scene of the principal strike, employed 3,800 men and boys.

For many years the company has employed a large number of skilled workmen who belong to the Amalgamated Association of Iron and Steel Workers, and has contracted for their employment with the officers of the association. On the first of July, 1889, a three years' contract was

made which was to terminate at the end of June, 1892. The workmen were paid by the ton, the amount they received depending on the selling price of steel billets of a specified size which they produced. If the price of these billets advanced, the wages they received per ton advanced without limit. If the price declined, their wages also declined to a certain point, called a minimum, but a decline in the selling price below this minimum caused no reduction in wages. This minimum was fixed in the contract at \$25.00 per ton. At the time of making the contract the market price of the billets was \$26.50 per ton.

As the time drew near for the contract to expire, the Carnegie Company, through its chairman, Mr. Frick, submitted a proposition to the workmen belonging to the iron and steel association as the basis of a new contract. The three most important features of the proposed contract were, first, a reduction in the minimum of the scale for billets from \$25.00 to \$22.00; second, a change in the expiration of the date of the scale from June 30th, to December 31st; third, a reduction of tonnage rates at those furnaces and mills in which important improvements had been made and new machinery had been added, greatly increasing the output and consequently the earnings of the workmen. At those in which no such improvements or additions had been made, no reduction in tonnage rates was proposed. The company gave as a reason for reducing the minimum that the market price of steel had gone down below \$25.00 per ton, and that it was unfair for the workmen to have the benefits of a rise in the market above \$25.00, and share none of the losses of the company when the market price fell below these figures. Indeed, the company contended that there ought to be no minimum as there was no maximum under the sliding scale. The workmen insisted that there ought to be a minimum to protect them against unfair dealing between the company and buyers, as they had no voice or authority in selling the products of their labor.

The reason for changing the time for closing the contract was that the company's business was less active at the end of the calendar year than in midsummer, and that it was easier to complete new arrangements for employment at that time. Another reason was that the company often made sales for an entire year, and consequently contracts for labor could be more safely made if they began and ended at times corresponding with contracts made with their customers. The workmen opposed this change in the duration of the contract for the reason that in midwinter they would be less able to resist any disposition on the part of the company to cut down their wages, and that in the event of a strike, it would be more difficult to maintain their situation than it would be in summer. They claimed, therefore, that the change in time would be a serious disadvantage to them in negotiating with their employers.

They submitted to the company a counter proposition, that the contract should end the last of June, as had formerly been the case, and

that if any change was to be demanded, three months' notice must be given them, and that, if this was not done, the contract, which was to run for three years, should continue for a year longer; in other words, from June 30, 1895, until June 30, 1896. This proposition was rejected by the company. On the other hand, the company finally proposed to make the minimum \$23 per ton for steel billets, and the Amalgamated Association, through their committee, proposed to reduce the minimum to \$24, but they refused to concede any more. In the way of showing the desire of the company to effect a renewal of the contract with their workmen, the following letter, written by Mr. Frick on the 30th of May and addressed to the Superintendent of the Homestead Steel Works, may be added:

"I now hand you herewith Homestead steel workers' wages scale for the open hearth plants, and 32 and 119-inch mills, which you will please present immediately to the joint committee, with the request that its decision be given thereon not later than June 24, 1893.

"These scales have had most careful consideration, with a desire to act toward our employes in the most liberal manner. A number of rates have been advanced upon your recommendation, and the wages which will be earned thereunder are considerably in advance of those received by the employes of any of our competitors on the same lines. You can say to the committee that these scales are in all respects the most liberal that can be offered. We do not care whether a man belongs to a union or not, nor do we wish to interfere. He may belong to as many unions or organizations as he chooses, but we think our employes at Homestead Steel Works would fare much better working under the system in vogue at Edgar Thomson and Duquesne."

On the 22d of June Mr. Frick addressed the following letter to Mr. Weihe, President of the Amalgamated Association:

"DEAR SIR—Our superintendent at Homestead, Mr. Potter, advises that a committee from your association waited on him last night and asked for a conference to-morrow at ten o'clock, and that, if satisfactory to us, to advise you to-day. We beg to say that we will be glad to meet you and a committee with full power to act for those of our Homestead employes who are members of your association to-morrow at this office at ten o'clock.

"Yours very truly,

"H. C. FRICK, *Chairman.*"

While these negotiations were pending the superintendent of the Homestead Steel Works had concluded contracts with all the employes, except 325 men of the highest skill who were employed in three of the twelve departments. All the others were to be paid on the former basis of remuneration without any reduction whatever. Of this number 280 would have been affected by the tonnage reductions and about 45 more by the tonnage reductions and scale minimum, or less than 10 per cent. of the entire number of employes. For the first five months of the Homestead Steel Works' wages scale, which expired on June 30, 1892, as above described, in other words, from August to December, 1889, the average monthly products of the departments for which the new scale beginning July 1st, 1892, had been proposed and presented to the Amalgamated Association, were as follows:

	<i>Tons.</i>
32-inch slabbing mill,	7,681
119-inch plate mill,	3,458
Open-hearth furnaces (per turn),	20

While the tonnages for May, 1892, were:

32-inch slabbing mill,	9,265
119-inch plate mill,	5,268
Open hearth furnaces (per turn),	23½

Showing a tonnage increase in—

	<i>Per cent.</i>
32-inch slabbing mill of	20.6
119-inch plate mill of	52.3
Open-hearth furnaces of	17.5

A comparison of the wages paid in representative positions at the beginning of the 1889-'92 scale with those which would be earned under the proposed 1892-'93 scale, shows as follows:

	1889-'92 SCALE, \$26.50 BASIS.		PROPOSED 1892-'93 SCALE.		
			\$26.50 BASIS.		Mini- mum, \$23 basis.
	Rate 100 tons.	Daily earnings.	Rate 100 tons.	Daily earnings.	
<i>32-inch slabbing mill (12 hours).</i>					
Heater,	4 31	\$6 37	\$4 31	\$7 68	\$6 67
Screwman,	4 61	6 81			6 41
Heater, first helper,	3 07	4 53	3 07	5 47	4 75
Heater, second helper,	1 73	2 56	1 47	2 62	2 27
Craneman,	2 23	3 29	1 33	2 37	2 06
Roll engineer,	2 50	3 69			3 24
Roll tableman,	2 50	3 69	1 60	2 85	2 47
Sweepers,	1 54	2 27	1 20	2 14	1 86
Shear tongsman,	1 54	2 27	1 25	2 23	1 94
Stamper,	1 40	2 07	1 32	2 37	2 06
Shearman,	2 50	3 69			4 00
Shear tableman,	1 73	2 56	1 47	2 62	2 27
Buggyman,	1 54	2 27	1 25	2 23	1 94
<i>119-inch plate mill.</i>					
	12 hours.		8 hours.		
Roller,	14 00	9 31	14 00	9 45	8 20
Screwman,	11 50	7 66	11 00	7 43	6 45
Tableman,	10 00	6 65	8 00	5 40	4 60
Hooker,	8 50	5 66	7 00	4 73	4 11
Sweeper, front,	6 00	4 50	5 00	3 38	2 93
Sweeper, back,	5 50	3 66	5 00	3 38	2 93
Shearman, 1st,	13 00	8 66	11 00	7 43	6 45
Shearman, 2d,	8 50	5 66	8 00	5 40	4 69
Leader, 1st,	7 75	5 16	6 00	4 05	3 52
Leader, 2d,	7 25	4 83	5 00	3 38	2 93
Heater,	22 00	14 66	11 00	7 43	6 45
Heater's helper,	15 00	10 00	6 00	4 05	3 52
<i>Open-hearth furnaces.</i>					
Melter's helpers, 1,	18 00	3 60	16 00	3 76	3 26
Melter's helpers, 2,	15 00	3 00	13 00	3 06	2 66
Charging machine,	15 00	3 00	14 00	3 29	2 86
Ladleman, 1,	17 00	3 40	16 00	3 76	3 26
Ladleman, 2,	14 00	2 80	13 00	3 06	2 66
Pitman, 1,	17 00	3 40	16 00	3 76	3 26
Pitman, 2,	14 50	2 90	13 00	3 06	2 66
Pitman, 3,	13 50	2 70	12 00	2 83	2 45

The proposed reduction would have fallen on those who under the old scale received the highest remuneration, but some of whom had the hardest work, while those who received the low grades of compensation and the common laborers would not have been affected. The reasons for making these reductions, so the company declared, were, first, that the improved machinery that had been put into the mill since the contract of 1889 enabled the men, with the same exertion, to increase largely the output and consequently to earn as much as before. This claim

was denied by the workmen, who insisted that the increased tonnage was largely due to more work by them. With respect to other changes, the workmen claimed that the putting in of additional machinery was not a certainty, and that if done it would result in a mutual benefit to the company, as well as to themselves, in producing a larger tonnage. They saw no reason, therefore, why their wages should be reduced.

Thus the contest was narrowed down to a small number of men, less than ten per cent. of those employed at Homestead. During the remainder of the month of June other steps were taken to effect an agreement, but the relations between the officers of the company and the workmen instead of improving grew worse. On the 28th the company began to close the different departments, and on the last day of the month work in all of them ceased.

From the evidence given before a committee of Congress, which investigated the strike, it appeared that on the 20th of June, Mr. Frick, the chairman of the company, began negotiations with Mr. R. A. Pinkerton, of New York, for the employment of three hundred guards or watchmen. Five days afterwards the negotiations were completed, and Mr. Frick sent instructions for the assembling and movement of the men. The time subsequently fixed for their arrival at Homestead was the 6th of July.

On the 25th of June the attorney of the Carnegie Company, Mr. Knox, notified the sheriff of Allegheny county that there would probably be a strike among the workmen at Homestead, and that the company was taking steps to obtain Pinkerton men for watchmen or guards, and that the company desired to have the sheriff deputize them or accept them as his posse to guard the works. The sheriff testified before the committee of Congress:

"I did not know whether I had the authority to deputize these people. I went for Mr. Petty, my attorney, and told him my conversation with Mr. Knox. I told him he could say to Mr. Knox that if these men were to be watchmen in the mill and the mills was attacked, and there was liable to be a destruction of property, or a loss of life to them, that I would deputize them, but the contingency would remain in my hands, and that the time I thought that should be done would be entirely optional with me."

On the morning of the first of July the foremen of one of the works were stopped at the gates by the striking workmen who were assembled there in large numbers. They had stationed guards at all the gates, and the river and the streets were patrolled. All the roads leading into the town of Homestead were guarded, and the closest scrutiny was exercised over all strangers who entered the town or approached the works. The works covered forty acres or more of ground and were inclosed on three sides by a tall plank fence, and on the remaining side by a steep bank that descended to the river. An advisory committee of fifty members was organized which exercised a general control over Homestead and the works of the company on the land sides and gates of entrance, but

did not have any guards stationed on the river side. The watchmen of the company were no longer permitted to enter the works, and the workmen clearly showed their intention to prevent the company from operating the works with other employes known as non-union men.

On the morning of the 4th of July the attorney of the Carnegie Company notified the sheriff that the strike was in progress at Homestead, and that the company feared the destruction of their property and wished the sheriff to interpose for its protection. He was also informed that the company would bring three hundred Pinkerton men and wished him to deputize them, and put them in the works as watchmen and guards. At noon, on the same day, the sheriff, accompanied by two deputies, had a conference with the advisory committee of the Amalgamated Association, who offered to put watchmen of their own into the works, and guaranteed their safety from destruction or injury. This was refused, the sheriff stating that by so doing he would only aid them in keeping out non-union men. But he supposed that he had effected an arrangement whereby he was to put fifty deputies of his own selection inside the works for their protection. The next morning, however, when these men were sent there they were permitted, by the advisory committee, to enter the works to see that no damage had been done, but were not permitted to remain.

On the evening of the 5th of July the Pinkerton men reached the scene. How they were received is thus described in the report made by Mr. Oates to the National House of Representatives.

On the evening of the 5th, with General Superintendent Potter and several of his foremen or assistants and Deputy Sheriff Gray on board, the boats of Rodgers proceeded down the river to meet the Pinkerton men. They met and received them on the barges, which were to be their temporary home, and during the night the two boats, each towing a barge, passed up the river. At a dam between Pittsburg and Homestead the machinery of one of the boats became disabled and the other steamer, the *Little Bill*, took both barges in tow and proceeded up the river.

When approaching Homestead a little steamer used by the strikers for patrol purposes gave the alarm by blowing her whistle, which was responded to by all the engines about town within the control of the workmen, and as the boat with the barges passed Homestead about four o'clock in the morning, just as day was breaking, people were seen assembling in great numbers upon the river bank, who ran along it, keeping pace with the steamer and firing pistols or other arms, the shots from several of which struck the steamer, one passing through the pilot house but doing no injury to anyone. When the crowd on shore reached the fence around the works, they were temporarily halted by that obstruction but tearing down a part of it, they rushed through and followed the boat, their numbers and excitement constantly augmented by new arrivals.

The steamer landed at the wharf of the Carnegie Company and upon its grounds. The boat made fast and shoved out her gang plank, when the crowd arrived opposite on the high bank, and a part of them ran down to the landing simultaneously with an attempt by the Pinkertons to land. They protested vehemently against the landing of the Pinkerton men. A short war of words ensued when one of the strikers threw himself down across the gang plank which was followed by firing on each side. The evidence is somewhat conflicting as to which party at this time fired the first shot, but the tendency of it is to show that the people on shore did it. However, as this matter is undergoing judicial investigation the committee express no opinion

upon it. A fusilade of one or two minutes ensued in which there were some killed and several wounded upon both sides. The people on shore fled in all directions and for a short time disappeared, while the Pinkerton men retreated into their barges, and under cover, and there remained.

No orders appear to have been given by Col. Gray, the deputy sheriff, nor by Mr. Potter, the superintendent, unless it was to order the Pinkerton men to cease firing. Gray and Potter, while on the boat and before reaching Homestead, advised the captains of the Pinkertons against the commission of any assault or overt act. The deputy sheriff testified substantially that his commission and instructions up there were merely to preserve the peace and to prevent a breach of it, and to order retreat, or take the Pinkerton men away in case of resistance. He seems to have observed his instructions to the extent of doing nothing whatever, except to retreat himself at the first opportunity. He and Potter and the latter's assistants, with the wounded, left upon Captain Rodger's boat about one hour after the firing ceased, and steamed up the river to take the wounded to the hospital.

After the lapse of some two or three hours the people on shore reappeared, composed of men, women, and boys to the extent of several thousand, when hostilities were resumed and firing recommenced. The Pinkertons had made port holes in one of the barges, from which they fired, and the people on shore had shoved forward to the edge of the bank and arranged breastworks out of the iron girders and other materials found in the yard and about the mills. They also obtained a piece of artillery and attempted to use it, but could not sufficiently depress it to strike the barges, and consequently fired over them. At about eleven o'clock, Captain Rodgers, with his boat and the deputy sheriff on board returned down the river and received a heavy fire from the strikers on shore and also from artillery on both sides of the river.

The intention of Col. Gray was, he swears, to take the barges away and tow them down the river, but the fire on the boat was so severe that she could not approach the barges. One or two of the crew were severely wounded. The pilot lay down in the pilothouse to avoid the shots and let the boat drift, but she finally passed Homestead and escaped to Pittsburg. At this time the people on shore were throwing oil into the river and firing it with the intention of burning the barges, but at this point there is slack water in the Monongahela river, and the wind was blowing up the river, which prevented the burning oil from setting fire to the barges. A car standing upon the track loaded with oil was consumed by the fire.

This state of affairs continued until about five o'clock in the afternoon, when the Pinkerton men on the barges hoisted a white flag and negotiated a surrender. They were allowed to take out their clothing, but their rifles, pistols, and everything else were taken possession of by the Homestead people. The barges were set on fire and destroyed, in the burning of which, the pump house belonging to the Carnegie Company was also destroyed.

Thus the sheriff as well as the Pinkerton men had failed in obtaining possession of the works. After the Pinkerton failure on the 6th of July the sheriff sent three telegrams to Governor Pattison requesting State aid to restore order. In each message the sheriff insisted on the necessity of troops. The Governor's response to each was somewhat similar, and in the last he said:

"Your telegram indicates that you have not made any attempt to execute the law and to enforce order, and I must insist upon your calling upon all citizens for an adequate number of deputies."

The sheriff then sought to execute the Governor's requirement that he should call on all citizens for an adequate number of deputies, and immediately prepared the following notice, which was served on over a hundred prominent citizens:

"All good citizens are hereby summoned to appear at the sheriff's office to-morrow, Thursday morning, at nine o'clock, with arms and subsistence to aid the sheriff in suppressing the riot in progress now at Homestead."

On the 10th Governor Pattison received the following telegram from the sheriff:

"The situation at Homestead has not improved. While all is quiet here the strikers are in control and express to me and to the public their determination that the works shall not be operated unless by themselves. After making all effort in my power I have failed to secure a posse respectable enough in numbers to accomplish anything, and I am satisfied that no posse raised by civil authority can do anything to change the condition of affairs, and that any attempt by an inadequate force to restore the right of law will result in further armed resistance and consequent loss of life. Only a large military force will enable me to control matters. I believe if such force is sent the disorderly element will be overawed and order will be restored. I therefore call upon you to furnish me such assistance."

On the receipt of this information the Governor directed General Snowden, who commanded the National Guard of Pennsylvania, to put the division under arms and to move at once with ammunition to the support of the sheriff of Allegheny county at Homestead. At the same time he sent a dispatch to the sheriff stating his order to General Snowden, and requesting that he put himself in communication with General Snowden and to communicate further particulars. Orders were at once issued for the entire division to move. The Second and Third brigades were to rendezvous at Brinton and the First brigade was to be held at Mt. Gretna in reserve. Brinton is on the Pennsylvania railroad, twelve miles east of Pittsburgh and a little over two miles from Homestead. The soldiers responded immediately to this order, and on the morning of the twelfth they entered Homestead.

As soon as the soldiers arrived the Carnegie Company took possession of their works, and began to make preparations to resume operations with non-union men. It was difficult to secure employes, and several months passed away before the company was able to obtain all the men desired. In the meantime the strikers showed plainly their dissatisfaction over the conduct of the company in thus endeavoring to resume operations, but resistance to their plans could no longer be attempted with any degree of success. At first the new employes were fed and housed within the inclosure, and this continued for several weeks until their number had increased to such a degree that they felt secure in going outside for their meals with the protection afforded by the sheriff's deputies. They were in effect voluntary prisoners.

On the 14th of July the men at the Union Iron Mills, which are also owned and operated by the Carnegie Company, were unwilling to work longer unless satisfactory arrangements were made with those employed at Homestead, and they also struck. Some remained for an hour or two after finishing their work to put their furnaces and machinery in good order. On the next day the employes in the Carnegie mills at Beaver Falls decided not to resume work until negotiations

had been opened with the men at Homestead. The following telegram was sent by the chairman of the Amalgamated Association to Mr. Frick:

"We, the Amalgamated Association at Beaver Falls, the rod mill, wire mill and nail mill, have come to the conclusion that we will refuse to work until such time as H. C. Frick, chairman of the Carnegie Steel Company, Limited, is willing to confer with the Amalgamated Association in order to settle the Homestead affair."

As the employes had recently signed an agreement with the company for a year's employment, Mr. Frick notified the employes, through the chairman of their committee, that if they did not return to work on the following Monday he would consider their failure as a cancellation of the agreement, and that when the works were in the future operated they would be by non-union men, and that former employes who desired to work would have to apply as individuals. He further stated that under no circumstances would he confer with the men at Homestead as members of the Amalgamated Association. The mill at Duquesne, however, remained in operation until the 22d, when the Homestead strikers appeared and prevented them from continuing at work. Within a week the employes, under the protection of the military, resumed their old places, and the mill was in as complete operation as ever. Operations in the mill at Braddock were at no time disturbed. The Union mills, whose employes struck in sympathy with the Homestead employes, as above described, were started in a few days with non-union men, and in a comparatively short period were in full operation. As these mills are located in the city they enjoyed the protection of an efficient police, and therefore it was not difficult to procure employes.

The company made an effort to employ their old workmen and fixed a time for receiving applications for employment from them. When the time had expired, however, which was on the 21st of July, not a single participant in the strike had returned. At this time about 150 men were employed. At a later period many of the old employes returned to work. On the 5th of September more than 100 went back; at this time about 200 others had also sought and obtained employment. On the 22d of July, by the suggestion of the Governor, a body of police officers, acting as deputy sheriffs, was organized to serve throughout the borough of Homestead. There were sixteen of these deputies, who were authorized to call on the military to observe order and maintain peace.

By the close of the month nearly a thousand men were at work at Homestead. On the 23d day of July Mr. Frick, the chairman of the Carnegie Steel Company, was shot in his office. This event created intense excitement. It was the work of one in sympathy with the strikers, but he was not one of their number.

Notwithstanding the large number of employes that had been secured, it was feared that if all the troops were withdrawn disorder would again

occur. The Third brigade was withdrawn at the close of July, while the Second remained. Portions of this brigade were from time to time withdrawn, the last disappearing from the scene on the 13th of October. At that time the mill was in full operation with non-union men.

There were many other events relating to this great strike with which the public are familiar, and which if fully described would fill a large volume. There were many arrests, trials, acquittals and convictions. One of the most noteworthy events in these legal proceedings was an attempt to prosecute Mr. Frick for his conduct, but which failed; and another, hardly less noteworthy, was the charge by the chief judicial officer of the state to the grand jury, in which the leading events of the affair were reviewed and the law relating to them applied.

Though the strike was ended in October, its formal termination by the Amalgamated Association was not declared until the 20th of November, when the disposition to return to work was very general. Since that time the company has employed a considerable number of those who participated in the strike, while many of them have not been able to obtain work anywhere. Regarding the strike as lasting nearly five months, as the monthly pay roll of the mill was about \$250,000, the loss to the striking employes for that period was not far from \$1,250,000. No estimate of the loss sustained by the company could be obtained. The expense to the state in sending and maintaining the National Guard at Homestead was \$440,256.31

STRIKES AND

INDUSTRIES.	LOCALITY.	CAUSE OR OBJECT.
Iron works,	Catasauqua,	Refusal of company to recognize the Amalgamated Iron and Steel Association.
Street railway,	Pittsburgh,	Refusal of company to agree to the terms of employes.
Rug manufactory,	Philadelphia,	For increase of wages,
Textile goods manufactory,	Philadelphia,	For increase of wages,
Silk manufactory,	Catasauqua,	Against rules of company,
Iron foundry,	Reading,	Against reduction of wages,
Cigar manufactory,	Philadelphia,	Against non-union men,
Iron and steel works,	Pittsburgh,	For shorter hours of labor,
File manufactory,	Philadelphia,	Tools improperly repaired,
Iron and steel works,	Pittsburgh,	Refusal of company to recognize the Amalgamated Iron and Steel Association.
Rolling mill,	Allentown,	Refusal of company to recognize the Amalgamated Iron and Steel Association.
Rolling mill,	Philadelphia,	Refusal of company to recognize the Amalgamated Iron and Steel Association.
Rolling mill,	Philadelphia,	Refusal of company to recognize the Amalgamated Iron and Steel Association.
Metal roofing,	Philadelphia,	Refusal of employer to agree to terms of employes.
Steam laundry,	Philadelphia,	Against introduction of machinery,
Iron and steel works,	Pottstown,	Employes objected to new men,
Metal roofing,	Philadelphia,	Refusal of employer to agree to terms of employes.
Brewery,	Philadelphia,	Refusal of company to agree to terms of employes.
Metal roofing,	Philadelphia,	Refusal of company to agree to terms of employes.
Cooperage,	New Castle,	Against reduction of wages,
Button manufactory,	Scranton,	Against reduction of wages,
Iron and steel works,	Pittsburgh,	Disagreement as to scale of wages,
Iron works,	Pittsburgh,	Disagreement as to scale of wages,
Cigar manufactory,	Ephrata,	For increase of wages,
Tile works (females lockout),	Beaver Falls,	Against rules of company,
Coal mining,	Latlin,	Improper loading of cars by miners,

LOCKOUTS.

Ordered by labor organization.	ESTABLISHMENT.		Number of persons engaged in strike.	Number of persons involved in strike.	Beginning.		End.		Duration—days.	Succeeded.	Loss.	Employers' loss.
	Number.	Days closed.										
					1891.		1892.					
Yes.	1	None. .	800	800	July	1,	Oct.	1,	455	No. . .	*	*
Yes.	1	1	243	243	Jan.	15,	March	9,	54	No. . .	\$18,000 00	\$43,000 00
Yes.	1	None. .	300	320	Feb.	1,	March	1,	29	No. . .	25,000 00	*
No.	1	None. .	116	516	Feb.	26,	March	17,	18	No. . .	7,000 00	*
No.	1	42	51	111	March	21,	May	2,	42	Yes. . .	1,200 00	*
Yes.	1	12	150	210	April	18,	April	30,	12	Partly,	2,500 00	*
Yes.	1	150	200	260	April	28,	Sept.	27,	150	No. . .	47,000 00	*
No.	1	18	80	90	May	2,	May	23,	18	No. . .	3,200 00	*
No.	1	None. .	15	15	June	13,	June	13,	None.	No. . .	*	*
Yes.	1	None. .	287	607	July	1,	Sept.	13,	75	No. . .	51,100 00	*
Yes.	1	45	45	170	July	1,	Aug.	15,	45	No. . .	9,000 00	2,000 00
Yes.	1	18	360	410	July	1,	Sept.	6,	67	No. . .	29,300 00	*
Yes.	1	41	130	280	July	1,	Aug.	10,	41	Partly,	12,000 00	*
Yes.	1	None. .	20	45	July	15,	†		. . . . .	No. . .	600 00	*
No.	1	None. .	45	45	Aug.	1,	†		. . . . .	No. . .	*	*
No.	1	2 hours.	100	400	Aug.	3,	Aug.	3,	2 hours,	Partly,	150 00	150 00
Yes.	1	None. .	20	20	Aug.	3,	Oct.	5,	63	No. . .	3,000 00	*
Yes.	1	None. .	10	10	Aug.	10,	Aug.	10,	None.	No. . .	*	*
Yes.	1	10	20	33	Aug.	10,	Aug.	21,	10	Yes. . .	500 00	200 00
No.	1	3	29	29	Aug.	17,	Aug.	19,	2	Partly,	105 83	75 00
No.	1	None. .	20	20	Aug.	22,	Aug.	24,	2	No. . .	*	*
Yes.	1	12	500	500	Aug.	30,	Sept.	13,	12	No. . .	12,000 00	5,000 00
Yes.	1	10	500	1,700	Sept.	6,	Not ended,		10	No. . .	150,000 00	*
Yes.	1	None. .	17	100	Oct.	18,	Oct.	18,	None.	No. . .	200 00	*
No.	1	None. .	54	69	Dec.	5,	Dec.	15,	None.	No. . .	390 00	*
No.	1	2	96	421	Dec.	9,	Dec.	12,	3	Yes. . .	1,000 00	560 00

* Not estimated. † Non-union hands employed.



THE LAWS RELATING TO WORKINGMEN IN PENNSYLVANIA.

In the last annual report the duty of employers to provide suitable machinery, competent workmen, etc., and their liability for accidents was described. Besides the legal relations which have thus been defined, a considerable number of statutes pertaining especially to the workingmen have been enacted. These will now be described, and also their legal construction and application, beginning with the subject of apprentices.

APPRENTICES.

1. The law of 1790 and amendments.
2. Minors may be bound apprentices by order of the orphans' court.
3. Masters must be of the same religious persuasion and of good repute.
4. The authority to bind apprentices is expressly reserved to the orphans' court.
5. The children who may be apprenticed.
6. They may be bound to charitable institutions.
7. What is meant by the term district.
8. Cases in which the public authorities can act.
9. In such a case the child need not join in the indenture.
10. The instrument is conclusive that the proper conditions existed.
11. Special legislation for apprenticing poor children.
12. Construction of these statutes.
13. After a long acquiescence such indentures cannot be annulled except for a palpable violation.
14. How children over whom public officers have no authority may be indentured.
15. A child cannot be bound without his consent.
16. The consent of the parent, guardian or next friend is also necessary.
17. Order of assent, first the father.
18. Next the mother.
19. Next the guardian.
20. Lastly the child's next friend.
21. The execution of an indenture without the guardian's consent is void.
22. Effect of guardian's consent.
23. Meaning of the art or trade in the statute.
24. Nature of the indenture.
25. To whom a child may be bound.
26. Extent of the period of service.
27. Education of the apprentice.

28. Special legislation on this subject for Philadelphia and Pittsburg.
29. The apprentice must be taught the entire art.
30. His support.
31. The indenture is binding only in the state.
32. Termination of the indenture. Death of the master.
33. His earnings after his master's death.
34. The indenture may be canceled by consent of all parties.
35. Penalty for preventing the taking of apprentices.
36. Remedies if the apprentice shall not properly conduct himself.
37. Construction of the statute.
38. The master's right to exercise a direction over his religious belief.
39. The service which the master may require the apprentice to perform.
40. When the apprentice has been abused how he may obtain relief.
41. Proceedings against absconding apprentices.
42. They are not justified in leaving in consequence of ill treatment.
43. Penalty for harboring apprentices.
44. Apprentices to be liable when of age.
45. Penalty for harboring or entertaining apprentices by inn-keepers.
46. Assignment of apprentices.
47. Assent of the parent or guardian is always necessary.
48. Executors cannot assign an apprentice.
49. Nor a co-partner.
50. Mode of proceeding when an apprentice wishes to obtain a discharge.
51. Present condition of the apprenticeship system.

1. The first statute was enacted in 1713, but the enactment of 1790 is the most important. This was amended nine years afterwards, and after that there was no more legislation until 1836. Since then three amendments have been made, in 1865, 1876 and 1878.

2. In an act for establishing orphans' courts, passed in 1713, it was enacted that "the justices of the said orphans' court in the respective counties shall, by virtue of this act, have full power and authority, * * * at the instance and request of the said executors, administrators, guardians or tutors, to order and direct the binding or putting out of minors, apprentices to trades, husbandry or other employments, as shall be thought fit.

3. "*Provided always*, That none of the said orphans' courts shall have any power to commit the tuition of guardianship of any orphans or minors, or bind them apprentices to any person or persons, whose religious persuasion shall be different from what the parents of such orphan or minor professed, at the time of their decease, or against the minor's own mind or inclination, so far as he or she has discretion or capacity to express or signify the same; or to persons that are not of good repute, so as others of good credit, and of the same persuasion, may or can be found." *

4. "The authority to order and direct the binding or putting out of apprentices to employment is expressly reserved to the orphans' courts." †

* Purdon's Dig. 98, §§ 1, 2; 1 Smith's Laws 81, §§ 7, 12.

† See act of Sept. 29, 1770, § 5; 1 Smith's Laws 311.

5. The law recognizes two kinds of children who may be apprenticed; those who are poor and are a charge on the public, and those who are not thus chargeable. In apprenticing the first class the law has provided: "It shall be lawful for the overseers of every district, with the approbation and consent of two or more magistrates of the same county, to put out as apprentices all poor children whose parents are dead, or by the said magistrates found to be unable to maintain them, so as that the time or term of years of such apprenticeship, if a male, do expire at or before the age of twenty-one years, and if a female, at or before the age of eighteen years."*

6. "All corporations, organized under any general or special law of this commonwealth, for the purpose of providing homes for friendless or destitute persons or children, shall be, and are hereby authorized to receive such children, upon indenture from the guardians, overseers or directors of the poor of any municipality; and also to bind out and provide suitable homes for all children committed to their charge, when maintenance is unprovided for by their parents or guardians."† In 1887 the legislature further provided that "in all cases where, by any law of this commonwealth, the guardian for the relief and employment of the poor of any city, district or township, are authorized to bind any orphan to any city, the said binding may be made by the mother, guardian or next friend of the said orphan, and shall be of the same force and effect, and as binding upon said orphan, as if the indenture were executed by the guardians of the poor.‡"

7. In construing these sections it may be inquired what is meant by the term district. The act relating to the poor § declares that the word district shall be construed to mean township and borough, and every other territorial or municipal division, and the term in the act under consideration doubtless has the same meaning.¶ It may be added that the authority of the public officers extends only to children who have a legal settlement in their district.¶

8. The public authorities can act only in cases in which the child is a public charge.** They cannot, therefore, apprentice a child which is not a public charge, by the mother's request, and thereby deprive the father of his child's custody.†† Moreover, a grandfather or grandmother, whenever possessing sufficient ability, is liable for the support

* Purdon's Dig. 98, § 3.

† Purdon's Dig. 98, § 4.

‡ May 23, 1887, Pamph. Laws 168, Purdon's Dig. 2219, § 10.

§ Purdon's Dig., page 1343, § 29.

¶ See *ex parte* McDonald, 7 Legal Gazette 333.

¶ See *ex parte* McDonald, 7 Legal Gazette 333.

** Commonwealth v. Vanlear, 1 Serg. & Rawle 250, Commonwealth v. Jones, 3 Serg. & Rawle 158, Commonwealth v. Martin, 1 Pearson 30, 32; Pennsylvania v. Montgomery, Addison 262.

†† Commonwealth v. Williams, 14 Lan. Bar 16.

of a grandchild.* Such a child, though having a father who is unable to furnish and support, cannot be indentured or bound out by the guardians of the poor.†

9. In apprenticing such a child, he need not join in the indenture.‡ In Crispin's case § it was contended that the child's signature was necessary, but Mr. Justice Gibson said that it would require strong expressions in the statute to induce him to consent to overturn the practice of nearly half a century, and during that period it had uniformly been customary for overseers of the poor to execute indentures of apprenticeship without requiring the signature of the apprentice.

10. When a child has been indentured by the public authorities, the instrument is regarded as conclusive that all the requisite conditions existed, and which cannot be questioned in a subsequent *habeas corpus* proceeding. The court will not interfere for a parent whose ability is not sufficient to maintain his child. ||

11. In much of the legislation for the regulation of the poor, in cities and other places, the authorities are authorized to apprentice children whose parents are dead, or who are unable to maintain themselves. In many cases the statutes are quite similar to the general statutes relating to the subject. These do not come within the scope of our undertaking, though it may be mentioned that on several occasions the courts have been required to construe and apply them.

12. In construing one of these statutes, enacted for Philadelphia in 1828, it was decided that the guardians had authority to bind out a child who had received public assistance from the out-door office of the guardian, but had not received such support in the almshouse or children's asylum. ¶

13. Furthermore, after an acquiescence of the parents for several years in the binding of such a child there must be a palpable violation of the law to induce the court to annul the indenture. In the Farley case Judge Parsons said: "A long acquiescence of parents in the binding, may in some cases be construed into an assent. It is to be borne in mind, that the father has visited his child at the residence of the master. The mother has seen her daughter quite as often as is reasonable, and the child many times has gone to see the mother. More than five years have rolled by since the indenture was executed, and this is the first application made to the court for relief. The master has fed and clothed the child while young and when unable to earn much for her support; and having attained that age which makes her labor of value,

* Whiting's case, 3 Pitts. 129.

† Whiting's case, 3 Pitts. 129.

‡ Commonwealth v. Jones, 3 Serg. & Rawle 158.

§ 3 Sergt. & Rawle 158.

|| Commonwealth v. Miller, 8 Pa. Co. Ct. Rep. 525.

¶ Commonwealth v. Farley, 3 Clark 49; but their power is limited to children having a legal settlement in the city, Commonwealth v. Jennings, 1 Browne 107.

we are asked to declare this contract void, which has surely been fully sanctioned by the tacit consent of both mother and father. It should be a clear case of the most palpable violation of the law, which would induce the court to pronounce such a decision. The facts disclosed before us do not, in my opinion, present any such case, and we refuse to declare the indenture void.”*

14. In another case† an act was construed relating to the authority of the directors of the poor of Dauphin county to bind out children as apprentices, and it was declared that they had no authority to do this unless such child was chargeable on the county.

In Whiting’s case‡ an act was construed that applied to the binding out of the poor children of Pittsburg. The court determined who such children were within the meaning of the act; and it was declared that the special statute was quite in harmony with the general one relating to such children.

We will now proceed to consider those children over whom the public officers have no authority. The act of 1770 provided that “All and every person or persons that shall be bound by indenture, to serve as an apprentice in any art, † mystery, occupation or labor, with the assent of his or her parent, guardian or next friend, [or with the assent of the overseers of the poor, and approbation of any two justices,] although such persons, or any of them, were or shall be within the age of twenty-one years at the time of making their several indentures, shall be bound to serve the time in their respective indentures contained, so as such time or term of years of such apprentice, if a female, do expire at or before the age of eighteen years, and if a male, at or before the age of twenty-one years, as fully, to all intents and purposes, as if the same apprentices were at full age at the time of making the said indentures, any law, usage or custom to the contrary notwithstanding.” §

15. In construing and applying this statute, we may begin by remarking that a child cannot be bound as an apprentice without his consent. || This point was fully considered by President King in *Commonwealth v. Murray*. ¶ As the law requires that he shall be bound by indenture, President King has remarked “no person can upon general practice, be bound by indenture without or against his consent.” Of course, as the judge remarked, the legislature could dispense with the necessity of the execution of an indenture by the child, and this, in fact, is done with reference to poor children who are apprenticed by public authorities.**

* See *Commonwealth v. Senneff*, 9 Hazard’s Reg. 78.

† *Commonwealth v. Martin*, 1 Pearson 30.

‡ 3 Pitts. 129.

§ Purdon’s Dig. 98, § 5.

|| *Commonwealth v. Atkinson*, 8 Phila. 375, 376.

¶ 1 Ashmead 123.

** *Commonwealth v. Vanlear*, 1 Serg. & Rawle 248; *Commonwealth v. Wilbank*, 10 Serg. & Rawle 416.

16. In addition to the child's assent that also of the parent, guardian or next friend is necessary, if the child has one.* Mr. Chief Justice Tilghman remarked in the *Vanlear* case: "But the true meaning is, that the assent of the parent or guardian must be had, except in cases where the infant becomes a charge on the county. The assent of the one or the other is necessary, according to the nature of the case. So with regard to the law in question. Where the apprentice has no parent or guardian (a very common case), his own consent shall be sufficient, but where he has a parent or guardian, under whose protection the law has placed him, on account of his own imbecility, the consent of that parent or guardian shall be necessary."

17. In thus assenting to the indenture the assent of the father, if living and competent to act, is required. †

18. But if the father is living, though incompetent to act by reason of his habits or other incapacity, the mother's assent will suffice. ‡

And even though the mother be married to a second husband, she may give her assent to the indenture independently of him. §

Again, if the mother should give her assent during her husband's absence, and on his return he should make no objection, not indeed until four years afterward, such conduct would be regarded as equivalent to his express consent, and therefore sufficient to confirm the indenture. || But she could not, by having her child apprenticed by the public authorities, when not supported by the public, deprive the father of his child's custody. ¶

19. The assent of the guardian also will suffice when there is no parent.** Various cases are reported in which he has signified his assent, but no legal question has arisen concerning his authority to act in this manner.

20. Finally, the assent of the child's next friend will satisfy this statute, †† but he can act only when there is neither parent nor guardian, †† unless the parent lives at a distance and has relinquished the protection of his child. §§ In order to act in this capacity the child's friend

* *Commonwealth v. Vanlear*, 1 Serg. & Rawle 248, 249; *Commonwealth v. Atkinson*, 8 Phila. 375; *Brotzman v. Bunnell*, 5 Wharton 128; *Commonwealth v. Crommie*, 8 Watts & Serg. 339.

† *Commonwealth v. Crommie*, 8 Watts & Serg. 339; *Commonwealth v. Martin*, 1 Pearson 32. See *Commonwealth v. Murray*, 1 Ashmead 123.

‡ *Commonwealth v. Coxe*, 1 Ashmead 71; *Commonwealth v. Martin*, 1 Pearson 32.

§ *Commonwealth v. Eglee*, 6 Serg. & Rawle 340. See *Commonwealth v. Callan*, 6 Binney 255.

|| *Commonwealth v. Senneff*, 9 Hazard's Reg. 78.

¶ *Commonwealth v. Williams*, 14 Lan. Bar 16.

** *Commonwealth v. Atkinson*, 8 Phila. 375.

†† *Commonwealth v. Roach*, 1 Ashmead 27; *Commonwealth v. Kendig*, 1 Serg. & Rawle 366, 367.

‡‡ *Commonwealth v. Atkinson*, 8 Phila. 275.

§§ *Commonwealth v. Kendig*, 1 Serg. & Rawle 366.

need not have received a formal appointment. "He must, however," says Judge Finletter, "have evinced, by his regard for the minor, a more than ordinary care and interest in his welfare."* A sister may thus act as the next friend of her brother.† She may also thus act even though binding him as an apprentice to her own husband.‡ Such a transaction, however, will be more strictly scanned than one in which he is to be bound to a stranger, and if the contract be tainted with fraud or collusion, the apprentice will be discharged.§ He will not, however, be discharged if the covenants in the indenture appear to be reasonable, and especially when the application is not made until he has ceased to be a burden.||

21. The execution of an indenture of apprenticeship by a minor without the consent of his guardian is void.¶ And an indenture of apprenticeship, enacted by one of full age, will not be operative, for the reason that the statute is enacted for the benefit of minors.**

22. Again, the consent of the guardian does not render him liable to the covenants contained in the indenture. Mr. Chief Justice Gibson has said: "The covenants of the apprentice, although executed under the supervision of those whom the law has set over him, are exclusively his own. The practice has, for the most part, been for the *prochein amy* to express his assent by sealing the indenture; but no one ever thought of having recourse to him on the contract; at least no instance of the sort has fallen under my notice. The reason is, that the legislature has not said that he shall become a party. The assent is sometimes expressed by subscribing as a witness; but neither in the one case nor in the other, has the *prochein amy* considered that he was contracting any responsibility for the apprentice. His covenant, if any existed, would be joint. But that would be inconsistent with his power which is not to subject, by any act of his, the person of the apprentice to the domain of the master; that can be done only by the apprentice himself. The *prochein amy* can join in the act, only so far as the law gives him authority; and, by the terms of the act of assembly, his agency is not to be active, but passive"††

23. We may next inquire what is meant by the art, mystery, occupa-

* Commonwealth v. Atkinson, 8 Phila. 376; Commonwealth v. Roach, 1 Ashmead 27; Commonwealth v. Schwartz, Purdon's Dig., 10th Ed., 73.

† Id.; Commonwealth v. Leeds, 1 Rawle 190, contra; Commonwealth v. Perrott, Bright 189.

‡ Commonwealth v. Leeds, 1 Rawle 190.

§ Commonwealth v. Leeds, 1 Rawle 190.

|| Commonwealth v. Leeds, 1 Rawle 190.

¶ Guthrie v. Murphy, 4 Watts 80.

** Commonwealth v. Sturgeon, 2 Browne 205. See also Commonwealth v. St. German, 1 Browne 24; and the Case of Pidgeon, 1 Browne 394.

†† Commonwealth v. Leeds, 1 Rawle 190, 195; Commonwealth v. Eglee, 6 Serg. & Rawle, 340; Velde v. Levering, 2 Rawle 268; Leech v. Agnew, 7 Pa. 21, 22; McAdam v. Stilwell, 13 Pa. 90.

tion or labor for performing or acquiring which, a child may be bound as an apprentice. It has long been held that a master cannot employ an apprentice as a servant. In *Republic v. Keppele*,* Mr. Justice Bradford delivered a very interesting opinion on this subject. In *Commonwealth v. Baird*,† President King, said: "Children may be bound apprentices to some useful trade, art or mystery, but our courts have frowned upon every attempt to bind them out as servants." In *Commonwealth v. Hemperly*,‡ President Judge Lewis, said that "an apprentice who was bound as such for the purpose of learning the art, trade or mystery of a house carpenter, and gives his services in consideration of instructions in that trade, is not bound to render any service as a menial or house servant, and the master has no right to require such service from him, and thereby to withdraw the attention of the boy from the art or trade he desired to learn. That the condition of an apprentice, whether to any of the learned professions, or to an art or trade, was highly advantageous, and he could not be reduced, against his consent, to the level of a menial or common house servant. Respectable as these last occupations may be, where faithfully pursued, many individuals and families have an aversion to pursuing them, and their feelings and rights should be respected. An apprentice to an art or trade is but a student, and he is as respectable in position as a student of law, medicine or any other profession. Every attempt to reduce him, against his consent, to the position of a house servant, should be discountenanced, as tending to prevent parents from binding their sons as apprentices to honorable and useful industrial pursuits. The frequency with which children are brought up either without any occupation on which they can rely for support, or in efforts to acquire a knowledge of professions for which they were never qualified by taste or talent, has its origin in the customary forgetfulness of the rights of the apprentice and the duties of the master. It is of the highest importance to the interests of society that these rights and duties should be distinctly understood and firmly maintained and enforced by the courts."§ But it has been declared that a child may be bound as a waiter.|| Housewifery, also, is a mystery within the meaning of this law.¶

24. Next may be considered the nature of the indenture. This must be signed by the master, the apprentice and his parent, guardian or next friend, and also sealed.** If, however, only the apprentice should sign the indenture, but it should be executed on his part, and after attaining

* 2 Dall. 197.

† 1 Ashmead 267.

‡ 4 Clark 440, 442.

§ *Leech v. Agnew*, 7 Pa. 21, 22.

|| *Commonwealth v. Vanlear*, 1 Serg. & Rawle 250.

¶ *Commonwealth v. Jennings*, 1 Browne 197. The terms servant and apprentice are not synonymous. *Altemus v. Ely*, 3 Rawle 307.

** *Commonwealth v. Atkinson*, 8 Phila. 375; *Phelps v. Pittsburg*, Cinn. & St. Louis R. Co., 99 Pa. 108; *Commonwealth v. Wilbank*, 10 Serg. & Rawle 415.

his majority he should claim his rights therein set forth, such action would be regarded as a ratification, and his master would be requested to fulfil his covenants.* But when a child is less than seven he is not required to sign and seal it. Says Mr. Justice Burnside: "Nothing can be more absurd than to require an infant * * * or under seven years, within the age of nurture to put his hand and seal to an indenture to make it binding."† But a child may be bound though under that age.‡

25. To whom may a child be bound? It has been decided that a child cannot be bound to a married woman even though the husband may give his assent to the binding, for as he is not a party to the indenture he cannot be responsible should the covenants or agreements be broken.§

26. The period of service must not extend beyond the child's minority.|| The law is enacted for the benefit of minors.¶ "Our act of assembly," remarked President Hamilton, in *Sturgeon's case*, "enforces a service till twenty-one years of age of males, and of females till eighteen; and all the provisions must be predicated on allowing and effectuating that end. Can it be said that an agreement between a master and a man of thirty or forty years of age, to learn the art of brewing, or any other trade, calling or occupation, by the name of apprentice, that such a person is within the scope, spirit and meaning of the act of one thousand seven hundred and seventy?" No limit is fixed on the minimum age of executing the indenture, but the period of service cannot be beyond the child's minority. Thus, in *Brotzman v. Bunnell*,** it was decided that a child under seven years of age may be bound as an apprentice in any art, mystery, occupation or labor.

27. The agreement, therefore, must be in writing and sealed by the several parties thereto, and "the binding must be to serve as an apprentice to some art, mystery, occupation or labor, and an indenture which does not set out this object is void."†† The indenture must contain other covenants or agreements. One of the most important of these, pertains to the apprentice's education. This covenant has been a frequent subject of legal dispute. In *Commonwealth v. Bowen* ‡‡ Judge Ludlow said: "In an indenture of an apprenticeship the master, by the common law and the laws of Pennsylvania, takes the place of a parent, and the apprentice of a child. In some of the old books the apprentice is spoken of as a species of relation; and while in one sense he is a servant, as

* *Pennsylvania R. Co. v. Bast*, 104 Pa. 26.

† *McGunigal v. Mong*, 5 Pa. 269, 271.

‡ *Brotzman v. Bunnell*, 5 Whart. 128.

§ *Commonwealth v. Medwinter*, *Purd. Dig.*, 10th ed., 73.

|| *Pennsylvania v. Montgomery*, *Addison* 262.

¶ *Commonwealth v. Sturgeon*, 2 Browne 205.

** 5 Wharton 125.

†† *Finletter, J.*, *Commonwealth v. Atkinson*, 8 Phila. 376; *Respublica v. Keppeler*, 2 Dallas 198.

‡‡ 5 Phila. 220, 222.

every child must be, yet he may not be bound as a servant, but must stand in the relation of a serving child. The obligations which this self-constituted relationship imposed were mutual; the apprentice shall conduct himself respectfully towards his master; shall obey his command; be faithful in his service, and act as any child should act toward his parent; and the master shall not only teach his apprentice his trade, but shall maintain and protect him; shall watch over his morals, see to it that he is educated, so that at last, when the term shall end, the apprentice may enter the society in which he lives, as a good workman, an intelligent and thoroughly trained man, able not only to sustain himself, but also to benefit and not curse the community in which he lives."

In *Commonwealth v. Atkinson* * it was declared that an indenture which did not provide for the support of the apprentice during the whole of the time which he had to serve, nor for his schooling, was fatally defective. Said Judge Finletter, in deciding this case: "In order that the apprentice may become an intelligent workman and citizen, the master must covenant for his schooling. It is now well settled that without this the court will cancel the indenture, unless it appear that the apprentice is sufficiently educated and intelligent not to require additional schooling, which has now been regulated by act of assembly, March 17, 1865."

In *Commonwealth v. Bowen* † Judge Ludlow said: "There is no covenant in this instrument for schooling, and it has been long since settled‡ that an indenture which does not contain this covenant is void; true, this principal is in a measure to be qualified, if it shall appear to the court that the apprentice has received sufficient education before he was bound to serve. § In this case, however, the only evidence produced upon this point consisted of an admission by the defendant 'that he had been over a year at school, and had got so far that he was studying geography, when he had to leave to go to work.' This court would not be justified in sanctioning the doctrine that a young man between seventeen and eighteen years of age had received sufficient education, when the evidence conclusively proves that he had been at school but little over a year, and had just commenced the study of geography. These masters and their apprentices will hereafter see the necessity which inclines the court to look with anxious solicitude to the proper education of the rising generation, for upon their intelligence depends the future prosperity not only of the young men, but of the commonwealth and nation."

In *Commonwealth v. Clark & Co.* || the minor was over seventeen

* 8 Phila. 375.

† 5 Phila. 220.

‡ *Commonwealth v. Perrott*, Brightley's Rep. 189.

§ See 1 Rawle 191, *Commonwealth v. Leeds*.

|| 4 Penn. Co. Ct. Rep. 90.

years of age, and the indenture had been executed after careful consideration. After reviewing several cases President Judge Seely remarked: "The indenture is not void for want of a provision of schooling; at most, it is but voidable. The interest of the minor himself is the prime consideration which should move the court to declare it void or to sustain it, and my full, clear conviction in the present case, in the light of all the evidence, is that I should do a wrong to this relator if I should declare this indenture void; that his own interest will be best promoted by holding him to his indenture and refusing his discharge. He seems to be an honest, intelligent young man. Upon the witness stand he says, without hesitation, that he read the indenture, understood it, understood that he was to learn 'roughing,' and has been receiving just the instruction which he contracted for; and that he is willing to go back to his work under his old contract whenever the other workmen return to their work."

One of the cases reviewed by Judge Seely was *Commonwealth v. Leeds*. * "In that case the apprentice, at the age of fifteen years, was bound for a special period of five years six months and twenty-one days, during which time the master covenanted to give him 'one-quarter's night schooling.' The opinion of the supreme court was delivered by Chief Justice Gibson, who said: 'It is objected that the quantum of schooling is unreasonably small. It appears, however, from the apprentice's signature to the indenture, that he wrote a fair hand; and the great object of the binding being to learn the art and mystery of the master, I would hold an indenture valid without any covenant for school at all, if it should appear that the education of the apprentice has been sufficiently attended to before.' In that case the insufficiency of the provision for schooling was not considered sufficient ground for avoiding the indenture."

28. The following statute has been enacted on this subject, which applied to the city of Philadelphia and county of Allegheny: "No indenture of apprenticeship shall hereafter be canceled, or deemed void, by reason of the want of any covenant on the part of the master, to assume the guardianship of, or to school or educate the apprentice: *Provided*, It shall appear, on the face of the indenture of apprenticeship, that said apprentice had arrived at the age of seventeen years, at or before the execution thereof; or in case said apprentice should not have reached said age, that satisfactory proof was given to the magistrate, at the time of binding, that the apprentice has received such an education, in reading, writing and arithmetic, as to render further schooling unnecessary; nor shall any such indenture be deemed void, by reason of any covenant, on the part of the master, to pay a certain sum, from time to time, to the father, mother, guardian or next friend of said apprentice, or to said apprentice alone, in case of the decease of the father or mother, in lieu of the maintenance, clothing and medical expenses of

* 1 Rawle 191.

said minor, or that the care, guardianship or maintenance of said minor was committed to the father, mother, guardian or next friend, or some near relation of said minor, when not employed by his or her master, in and about his works: *Provided*, That this act shall apply only to the city of Philadelphia and the county of Allegheny." *

Next may be considered the covenant or agreement concerning the apprentice's trade or occupation. The master must teach him the whole of the trade mentioned in the indenture in all its branches.† In a note to Purdon's Digest‡ the editor has expressed the requirement more fully. When an apprentice is bound to a master to learn a trade, he must teach him the whole of it in all its branches, and the keeping of the apprentice to a subordinate branch, though such condition of labor might expedite and perfect the whole work when completed, is a violation of his covenant, and a sufficient cause for cancelling the indenture. But it has since been decided that an indenture for instructing an apprentice in a branch of the art or trade of glass cutting known as "roughing" will not be declared void as teaching only a portion of an art. President Judge Seely has remarked, in a case in which this question required an answer: "This peculiar feature of the indenture was considered and discussed at the time the indenture was executed. 'Roughing' was then considered by the parties a sufficient art or employment. The evidence only confirms that opinion. In former years, it is true, and perhaps in some places, at present, a glass-cutter was expected to take the rough blanks as they came from the mold or blown and finish them for market, 'roughing, smoothing and polishing' them. It seems, however, from the evidence presented at the hearing, that, in more recent years, the custom has grown up of committing the separate parts of this work to different workmen who follow 'roughing' or 'smoothing and polishing' as separate and special occupations; and to hold that 'roughing' is not a distinct vocation or employment by itself, needing to be specially taught, would do violence to the evidence in the case."

30. Lastly, may be considered the question of the apprentice's support. Formerly the apprentice was an inmate of the master's house, and in a case decided in 1845 Chief Justice Gibson remarked that in the country he was still a member of the family. But the law does not require that he shall be an inmate, for he may have more apprentices than he can accommodate in his own house, and in such a case necessity would compel him to board them out. "Besides, his business may carry him to a distance from home, as often happens in the country, and his apprentice must go with him. There is nothing in the statute or the usages of the country to forbid such binding."§

* Purdon's Dig. 99 § 6.

† Commonwealth v. Atken, Purd., 10th ed., 74.

‡ Page 100.

§ Gibson, C. J., Commonwealth v. Conrow, 2 Pa. 402, 403; Commonwealth v. Clark & Co., 4 Pa. Co. Ct. Rep. 90, 91.

The indenture must provide for the apprentice's support during the entire time of his apprenticeship.* In *Commonwealth v. Atkinson*† Judge Finletter said: "Upon what principle could an indenture, which gave no support for any portion of the time, be sustained? It lacks one of the most essential purposes and considerations of such contracts. Whilst it leaves the apprentice free to starve or steal, it forbids him to labor, if he could obtain employment, because it contains his covenant to give all his time, care and labor to the business and interests of his master." If, however, the annual compensation is to be given only during nine months in the year, but is adequate for the apprentice's support for the remaining three months, this is a valid covenant.‡

In *Commonwealth v. Bowen*§ the indenture contained no express covenant for maintenance; the apprentice was to receive so much per week, and then by the piece, and the mother was to be his guardian and take care of him if he became sick. Employment was to be given him during such times as the master's foundry was in blast, and certain payments were to be made for the time that he should be at work. The court remarked that the apprentice in this case, should the furnace go out of blast, or he at the same time be afflicted with sickness, might starve or die. The instrument was declared void.

In another case the master covenanted to pay to the father of the apprentice a weekly sum "toward the support of the said apprentice." It was held that the master was bound to make the weekly payments during the apprentice's sickness as well as at other times.||

An agreement that the apprentice's wages shall be paid to his mother, without any consideration therefor, cannot be enforced in her favor.¶

In *Pennsylvania Railroad Co., v. Bost*** the indenture provided that in case of absence during his term (except occasioned by sickness) the apprentice should serve such additional time as would make up the time lost; and if the company should suspend, wholly or in part, work in the shops, his wages should be correspondingly suspended; and that ten per cent. of the wages earned should be retained as security that the employe should complete his term of service. In an action by the employe, after he arrived of age, the court held that upon performance of his contract he was entitled to recover; that he was bound, however, to make up for lost time (not from sickness) when the company had full or partial work for him to do, but not for time when he was idle because the company suspended work and wages, wholly or in part.

31. We may next inquire where the indenture is operative. Long ago it

**Commonwealth v. Atkinson*, 8 Pa. 375; *Commonwealth v. Conrow*, 2 Pa. 402.

†8 Pa. 375, 376.

‡*Commonwealth v. Conrow*, 2 Pa. 402.

§5 Phila. 220.

|| *Corfield v. Fitler*, *Purd. Digest*, 10th ed., 74.

¶ *Leech v. Agnew*, 7 Pa. 21.

**104 Pa. 26.

was decided that a master could not take his apprentice out of the state unless it expressly gave him the power, or was done as an incident from the nature of the trade which the apprentice was to acquire. § In *Edwards' case** a child was apprenticed in Virginia and brought into this state. Mr. Chief Justice Tilghman said: "Although there is no express stipulation that the apprentice shall not be removed from Virginia, yet it is to be understood from the nature of the case. It must be supposed, that when the legislature of any state vests in its courts a power over the persons of orphans, that power is to be so exercised that the orphans shall not be withdrawn to places beyond the jurisdiction of the state, except those who are bound to the sea service which must necessarily call them abroad. While within that jurisdiction they are sure of protection from the same laws which authorized their binding. But the moment they enter a country where other laws prevail, they may receive treatment very different from what was contemplated by the court under whose authority they were bound. If it be permitted to remove this apprentice beyond the limits of Virginia, she may be carried to the West or East Indies. There is no medium. The service must either be restricted to Virginia, or not restricted at all. The consequence of a boundless license of removal would be monstrous."

The same question was decided in a similar manner in *Commonwealth v. Deacon*.† The same justice, after referring to the *Edwards case*, remarked: "When the law of any country permits an infant to bind himself to serve another, it is with a view to the infant's benefit, and to the protection afforded him by the same law. Besides the very nature of the contract shows that it never could have been intended to give power to the master to carry his apprentice to a foreign country; the health, the diet, the clothing, the protection of the friends, as well as of laws, the local privileges and advantages derived from serving an apprenticeship; all these are of importance to the infant, and all may be lost if he be carried abroad. Is it not monstrous to think that a young man, bound apprentice, in a healthy country, where the society is civilized and well governed, should be torn from his friends and country, and carried to a bad climate, where the laws yield but feeble protection? It is very true that a removal from England to the United States of America, might be for the advantage of many apprentices; but if the principle be just, they may be carried to any part of South America, of Africa, or the East Indies; and so might our own young men, bound in our own city, be carried to the same miserable places. The case is too plain to admit of much argument; we are struck with the truth as soon as the question is proposed."

32. While the relationship cannot extend on the part of the apprentice beyond his minority, it may be inquired, does it terminate on the death of

**Commonwealth v. Edwards*, 6 Binney 202.

†6 Serg. & Rawle 526.

the master? It certainly does, unless the indenture contains a covenant or agreement for its continuance by other parties, his heirs, executors or assigns. This question will be more fully considered when treating of the law relating to the assignment of indentures. In many cases the relationship is clearly intended to be solely between the child and his master. In *Commonwealth v. King** Mr. Justice Gibson remarked, concerning the contract in that case, that it was "in its nature fiduciary on the part of the master. The personal confidence reposed in him is one (perhaps the chief) ingredient in the consideration of the contract; and, however willing a parent or guardian may be that the apprentice shall be assigned by the master himself, in whose integrity and discretion they have confidence, or remain with his family after his death, yet they may, with reason, be unwilling to delegate the same authority to his executors or administrators, who may be strangers to them or persons wholly unworthy of their confidence. The act confers an authority unknown to the common law, and we must adhere strictly to its words."†

33. Again, when the indenture does not extend to the master's executors and administrators, they are not entitled to the earnings of the apprentice after his master's death.‡

34. The indenture, however, may be canceled by the consent of all the parties thereto. In *Graham v. Graham*§ this question was considered by Mr. Chief Justice Tilghman: "To say that the parties to a contract may not annul it is contrary to all principle and all convenience; and if such were the law it would bear particularly hard upon the apprentice. It is often discovered, after a young man is bound, that his parents have mistaken his genius; and not unfrequently his constitution proves unequal to the business in which he is engaged. When all parties perceive this, and are desirous of annulling the contract, why should they not be permitted to do so? It is objected, that the minor may be unable to form a good judgment; but, surely, he must be as able to judge as he was when he bound himself, and more so, because he is older; and it requires no more understanding to judge of the dissolution than of the making of a contract. Besides, the minor has the assistance and protection of his parent or guardian, whose consent is necessary for the annulling of the indenture. In a word, I can perceive nothing which excepts this case from the general maxim, 'that contracts may be dissolved by the consent of the parties.'"

"Any person, who shall, either in an individual capacity, or as a member of any association, attempt, by any unlawful means whatever, to prevent any mechanic, employe or person having charge of any manufacturing business, from taking as an apprentice any minor, whose pa-

*4 Serg. & Rawle 109.

†See *Kennedy v. Savage*, 2 Browne 178.

‡*Kennedy v. Savage*, 2 Browne 178.

§1 Serg. & Rawle 330.

rents or guardians are desirous of apprenticing said minor, or where such minor is without parents or guardians and desires to apprentice himself or herself, shall be guilty of a misdemeanor; and on conviction thereof in the proper court of quarter sessions, shall be sentenced to pay a fine not exceeding one hundred dollars, or to imprisonment not exceeding three months, or both, or either, at the discretion of the court.”*

“If any master or mistress shall misuse, abuse, evilly treat, or shall not discharge his or her duty towards his or her apprentice, according to the covenants in the indentures between them made, or if the said apprentice shall abscond or absent him or herself from his or her master or mistress’ service without leave, or shall not do and discharge his or her duty to his or her master or mistress, according to his or her covenant aforesaid, the said master or mistress, or apprentice, being aggrieved in the premises, shall or may apply to any one justice of the peace of any county or city where the said master or mistress shall reside, who, after giving notice to such master or mistress, or apprentice, if he or she shall neglect or refuse to appear, shall thereupon issue his warrant for bringing him or her, the said master, mistress or apprentice before him, and take such order and direction between the said master or mistress, and apprentice, as the equity and justice of the case shall require; and if the said justice shall not be able to settle and accommodate the difference and dispute between the said master or mistress, and apprentice, through a want of conformity in the master or mistress, then the said justice shall take a recognizance of the said master or mistress, and bind him or her over to appear and answer the complaint of his or her said apprentice, at the next county court of quarter sessions to be held for the said county or city, and take such order with respect to such apprentice, as to him shall seem just; and if through want of conformity in the said apprentice, he shall, if the master or mistress, or apprentice request it, take a recognizance of him or her, with one sufficient surety, for his or her appearance at the said sessions, and to answer the complaint of his or her said master or mistress, or commit such apprentice, for want of such surety, to the common jail or workhouse of the said county or city, respectively; and upon such appearance of the parties, and hearing of their respective proofs and allegations, the said court shall, and they are hereby authorized and empowered, if they see cause, to discharge the said apprentice of and from his or her apprenticeship, and of and from all and every the articles, covenants and agreements in his or her said indenture contained; the said indenture of his or her said apprenticeship, or any law or custom to the contrary notwithstanding; but if default be found in the said apprentice, then the said court is hereby authorized and empowered to cause, if they see sufficient occasion, such punishment by imprisonment of the body and confinement

* Purdon’s Dig. 99, § 7.

at hard labor, to be inflicted on him or her, as to them in their discretion, they shall think his or her offense or offenses shall deserve.”*

37. In construing this statute the principal inquiry has related to the nature of the treatment of the master toward the apprentice. In *Commonwealth v. Hemperly*,† it was declared that a master has legal authority over his apprentice, and is not liable to an indictment in a criminal court for every mistaken exercise of that authority. To sustain such a proceeding there must be such proof of cruelty or improper conduct on the part of the master as to justify the jury in believing that he acted in bad faith, and sought the gratification of his own passions rather than the establishment of his supposed rights or the benefit of the apprentice.‡ This subject was considered in an earlier case decided in 1806.§ It seemed that the apprentice had been required to work on Sunday. The court said: “We think it our duty to declare that the terms of the act—misuse, abuse and ill-treat, are sufficiently comprehensive to include acts injurious to the mind and morals, as well as to the body. An apprenticeship is an important trust, and includes a due attention to the principles of moral rectitude and proper habits of industry. A master may feed and clothe the body, and keep his apprentice diligently employed, and this is right. But if he designedly corrupt and poison his mind by the infusion of immoral principles—if he compel him to work on Sunday, or if he withhold from him the means of public worship and religious instruction, it should be remembered, a persevering conduct of this sort, will be ground for discharging the ’prentice from the covenants in the indenture.” Under the peculiar circumstances of the case, and the expectation that the ’prentice in the future would not be employed to work on Sunday, he was not discharged from his master.

38 The master’s right to exercise a direction over the religious opinion of his apprentice was carefully considered in *Commonwealth v. Farley*.|| The court declared that this was a delicate question, and that it had not been explicitly determined. “We are of the opinion that if a master, while his apprentice is of a tender age, sends him to that church where he and his family worship, and puts him under the Sunday school instruction of the same denomination of Christians, no matter what may be their creed or form of worship, if it be that of the living and eternal God, we think he does ‘discharge his duty towards his apprentice,’ within the meaning and intent of that act of assembly.

“When, however, the apprentice has arrived at an age for the suitable exercise of a sound discretion, and guided by an enlightened conscience, from purity of heart dictated by high religious obligations impressed

* Purdon’s Dig. 100, § 8.

† 4 Clark 440.

‡ *Commonwealth v. Guidhart*, 41 Legal Int. 115.

§ *Commonwealth v. St. German*, 1 Browne 24, 29.

|| 3 Clark 49.

upon his mind from a faithful perusal of the sacred scriptures, he desires to worship with a congregation entertaining religious sentiments from those of his master, or in accordance with the faith of his parents; in such a case the master would be bound to let the apprentice follow the dictates of his own conscience; and if he attempted to exercise an arbitrary control over the apprentice, and restrain him from following in what he deemed the path of moral or religious duty to his Creator, I would then hold the master was not 'discharging his duty to such apprentice,' within the true intent or meaning of the act of assembly; and especially if the apprentice made the complaint to the court under the provisions of that law. * * *

"How far the court will go in a case where the parent makes a complaint while the child is young, as in the present, it is a question of still greater difficulty, and in my opinion each case as it is presented before us must be determined according to its own peculiar circumstances; regard being had to the character and conduct of the master, as well as respect to the feelings of an unfortunate parent. It is difficult to state principles that would be just when applied to the numerous cases which may arise in a community. And how far the exercise of parental authority is relinquished by the contract of indenture, when made with the approbation of the parent, and when executed by the guardians of the poor under the authority of the law, are questions of very grave consideration, and are worthy of much reflection when presented for adjudication. I shall decide this cause on the special facts before me."

39. With respect to the occupation or service which a master may require his apprentice to perform in Frayne's case,* it was contended that the statute under consideration was violated in employing a child six years old on the stage. The court remarked that without expressing any opinion on the character of the business specified in the indenture, it was clear that a master who introduced his apprentice, who was not more than six years old, on the stage at the theatre acted in direct conflict with his duty and the indenture was canceled.

40. When the apprentice has been misused, abused or evilly treated the statute prescribes how he shall obtain relief. If the complaint is well founded, the relationship of master and apprentice may be severed.†

41. "If any apprentice of any of the arts, trades, mysteries, occupations or labor aforesaid, shall depart or abscond from his or her master or mistress' service in any other county of this province, or into the city of Philadelphia, it shall and may be lawful to and for any justice of the peace of such county or city to issue his warrant to any constable within his county or city, to apprehend, take and have the body of such ap-

* Commonwealth v. Dodge, 6 Weekly Notes 214.

† Commonwealth v. Atkinson, 8 Phila. 375.

prentice before him, or some other justice of this county; and upon such appearance and hearing of the complaint and defense of the parties, if default be found in the said apprentice, then and in such case, the said justice of the peace before whom such a warrant shall be returned, shall commit him or her to the common jail of the county where his or her said master or mistress shall reside, unless he or she will consent to return home, or shall find sufficient surety to appear at the next sessions, to be held for the county where such master or mistress shall reside, and answer the complaint of the said master or mistress, and not to depart the same without leave.”*

In enforcing this statute, if an apprentice should enlist in the army, his master could obtain him by a *habeas corpus* proceeding if he was unwilling to return. The only remedy of the master would be to sue the officer who enlisted the apprentice. A *habeas corpus* is intended to secure personal liberty, and not to recover property.†

When an apprentice has absconded, his master may peaceably enter the house of another to recapture him, unless forbidden by the owner. And at common law any person with authority from the master might do the same.‡

42. An apprentice is not justified in leaving his master's service in consequence of ill-treatment or a violation of the covenants contained in the indenture; redress must be sought by proceeding under the statute. This fully explains what the apprentice must do in such a case.§

43. “If any person or persons, whatsoever, shall harbor, conceal or entertain any such apprentice, knowing him to be such, during the space of twenty-four hours, without his or her master or mistress' consent, and shall not give notice thereof to his or her said master or mistress, every such person or persons offending in the premises, shall pay to the said master or mistress the sum of twenty shillings, for every day he shall so harbor, conceal or entertain such apprentice, to be recovered in a summary way, as debts under five pounds are by law directed to be recovered, if the same shall not exceed five pounds; if otherwise, to be recovered by action of debt, to be brought at the suit of the party injured, in any court of common pleas within this province.||

44. “If any apprentice shall absent himself or herself from the service of his or her master or mistress, before the time of his or her apprenticeship shall be expired, without leave first obtained, every such apprentice, at any time after he or she arrives at the age of twenty-one years, shall be liable to, and the master or mistress, their heirs, executors or administrators, are hereby enabled to sustain all such actions and other

*Purdon's Dig. 100 § 9.

†Commonwealth v. Robinson, 1 Serg. & Rawle 353; Commonwealth v. Harris, 7 Penn. Law Jour. 283.

‡Pennsylvania v. Kerr, Addison 323.

§ Commonwealth v. Linker, 8 Phila. 455.

|| Purdon's Dig. 101, § 10.

remedies against him or her, as if the said apprentice had been of full age at the time of executing his or her indenture of apprenticeship.”*

45. “No inn-keeper or tavern-keeper shall receive, harbor, entertain or trust any person under the age of twenty-one years, or any apprentice or servant, knowing him to be such, or after being warned to the contrary by the parent, guardian, master or mistress of such minor, apprentice or servant, under penalty, for the first or second offense, of three dollars, over and above the forfeiture of any debt contracted by such minor, apprentice or servant, for liquors or entertainment; and for the third offense, under penalty of fifteen dollars, and the forfeiture of his license, and of being forever incapable of receiving a license to keep a public inn within the commonwealth.”†

46. “When any master or mistress shall die, before the term of apprenticeship shall be expired, the executors or administrators of such master or mistress, provided the term of the indenture extended to executors and administrators, shall and may have a right to assign over the remainder of the term of such apprenticeship to such suitable person, of the same trade or calling mentioned in the indenture, as shall be approved of by the court of quarter sessions of the county where the master or mistress lived, and the assignee to have the same right to the service of such apprentice, as the master or mistress had at the time of his or her death; and also, when any master or mistress shall assign over his or her apprentice to any person, of the same trade or calling mentioned in the indenture, the said assignment shall be legal, provided the terms of the indenture extended to assigns, and provided the apprentice, or his or her parent or parents, or guardian or guardians, shall give his, her or their consent to such assignment, before some justice of the peace of the county where the master or mistress shall live.” ‡

47. In enforcing this statute, it may be remarked that no indenture of an apprenticeship, even though executed by an overseer of the poor, can be assigned without the assent of the parent or guardian. § In *Commonwealth v. Jones*, || Mr. Chief Justice Gibson gave the reasons for this requirement: “I am of opinion that the assent of all parties requisite to give validity to the assignment of an indenture, should be certified by the justice, or at least expressed in writing before him, and attached to the instrument at the time of such assignment. What is the object of requiring the presence of a justice of the peace? Certainly not merely that he may be a witness to prove the assent of the apprentice, parent or guardian, in case that fact should be disputed, for any other witness of equal personal respectability, would answer the purpose

*Purdon's Dig. 101, § 11.

† Purdon's Dig. 101 § 12.

‡ Purdon's Dig. 101, § 13.

§ *Commonwealth v. Jones*, 3 Serg. & Rawle 158; *Commonwealth v. Leeds*, 1 Ashmead 405

|| 3 Serg. & Rawle 158.

quite as well; but his intervention is to be official, and should, therefore, be attested or certified in the same manner as any other official act. He is to receive the assent of the apprentice, and see that it is not extorted by the coercion or fraud of the master. This provision of the act was intended to afford the same protection to the apprentice that a separate examination does to a *feme covert* about to acknowledge a deed.”*

In *Commonwealth v. Kendig* † a master attempted to assign the indenture of his apprentice as his next friend, but this was regarded as an evasion of the law. Said Mr. Chief Justice Tilghman: “In this case there was no consent of parent or guardian, but of a person who called himself next friend. Considering that the father of the infant lived at a distance in another state, and that he had long relinquished the protection of his child, I should have thought that she might have been bound without his assent, under the guidance of a person who could properly be considered as her next friend; but I cannot view Cyrus Pearce in that light, because I consider the binding to Baker, and assignment to Kendig, as nothing else than a sale by Pearce to Kendig, through the intervention of Baker, who is a broker in this kind of business. Without meaning to reflect at all on the character of Mr. Pearce or Mr. Kendig, both of whom stand fair before the court, I think it would be of dangerous consequence to admit, that a man who is about to sell his apprentice, should take the place of next friend, because he must be supposed to be acting for his own interest, which is incompatible with the idea of a guardian.”

48. An indenture binding an apprentice to a man, his heirs and assigns without naming executors, cannot be assigned by them. This subject was fully considered by Mr. Justice Gibson in *Commonwealth v. King*.‡

49. In like manner, when an apprentice is bound to two co-partners or the survivor of them, and the indenture provides that in the event of dissolution he shall have the right to elect whom he shall serve, and the partnership is subsequently dissolved, one partner assigning all his interests to the other, the apprentice's election, in order to be binding, must be done with the consent of the parent or guardian, and if such consent is not obtained the indenture is abrogated on the dissolution of the partnership.§

50. When the apprentice seeks to obtain a discharge from the indenture the proper mode of proceeding is by a *habeas corpus*. Most of the interpretations of this statute have been rendered in proceedings of this nature. It may be added that when the indenture is void on its face the minor may be discharged on such a proceeding.||

**Commonwealth v. Vanlear*, 1 Serg. & Rawle 248.

† 1 Serg. & Rawle 366.

‡ 4 Serg. & Rawle 109.

§ *Commonwealth v. Leeds*, 1 Ash. 105.

|| *Commonwealth v. Atkinson*, 8 Phila. 375.

51. The system of apprenticeship has very considerably declined, nevertheless a large number of persons are serving as apprentices in manufacturing and other places. In the fifteenth annual report of the bureau, for 1887, an account was given of the system of apprenticeship existing in the Keystone saw, tool and file works, at Tacony. "When boys begin their art, they are seventeen years old, and their term of apprenticeship lasts for four years. At present there are fifty-five apprentices. Formerly a written agreement was signed by both parties, but the company has been somewhat remiss in this regard until recently. Now, the old practice of having the conditions of apprenticeship in writing has been resumed." A copy is also given of the indenture in force between the company and its apprentices

EXEMPTION OF PROPERTY FROM EXECUTION.

1. What property is exempt from execution.
2. The exemption should always be allowed when this can be done without injury to creditors.
3. To what cases the exemption is limited.
4. Non-residents cannot claim it.
5. Nor grantors who have parted with all their interest in their land.
6. Nor can the exemption be claimed in land conveyed to defraud creditors.
7. Nor can mortgagors claim it.
8. When the exemption can be claimed against judgment creditors.
9. Executors.
10. When exemptions are not allowed. Ejectments.
11. Executions on judgments and replevin bonds.
12. Landlords.
13. Joint owners.
14. Partners.
15. Mechanics' lien.
16. Constables.
17. Minors.
18. Married women.
19. Tenants.
20. Tenants in common.
21. Distributees.
22. Fraudulent debtors.
23. Actions *ex contractu*.
24. Garnishees.
25. Debtors' exemption has priority over the costs of execution.
26. At what time the debtor must claim the exemption.
27. How the value of the property in which the exemption is claimed is to be determined.
28. Mode of proceedings.
29. If divided how the residue is to be sold.
30. Date of operation of the act.
31. Who can administer the oath to the appraisers.
32. Exemption may be taken in money or in other things.
33. Sewing machines are exempted.
34. Including those in private families.
35. Exemption of leased pianos.
36. No exemption on judgments for wages not exceeding \$50.00.

EXECUTION.

1. "In lieu of the property now exempt by law from levy and sale on execution, issued upon any judgment obtained upon contract, and distress for rent, property to the value of three hundred dollars, exclusive of all wearing apparel of the defendant and his family, and all bibles and school books in use in the family (which shall remain exempted as heretofore), and no more, owned by or in possession of any debtor, shall be exempt from levy and sale on execution or by distress for rent."*

2. "In furtherance of the humane beneficent object of the act," says Mr. Justice Sterrett,† "exemption which it authorizes should always be allowed when it can be done without prejudice to the rights of creditors."‡ In broader language Mr. Justice Armstrong declared that "the law was passed, not only for the benefit of the debtor himself but for his family. It should, therefore, receive a construction favorable to the benevolent object of its enactment."§

3. It will be noticed that the exemption of the debtor's property from levy and sale on execution is limited to cases in which judgments have been obtained on contracts and distrainments for rent. In other cases, therefore, no exemption exists. Consequently, when a judgment is founded on a wrong, in other words in *ex delicto* actions, no exemption exists in favor of the wrong-doer. The act of 1828, || entitled "An act for the relief of the poor," provided for the exemption of specific articles, not only on an execution issued for rent, but also for damages, except those done to real estate, etc. In 1836, the law on this subject was revised, ¶ and the twenty-sixth section of the act of 1828, relating to exemptions, was incorporated. Finally, in 1849, the present law was enacted which repealed the twenty-sixth section of the act of 1836, and also the seventh and eighth sections of the act of April 22, 1846, and established the existing system. "This act," says Judge Williams, "creates a complete, and in many respects a new, system, but excludes one class of debtors from its operation. It then expressly repeals the acts of 1836 and 1846 which embodied the old system. We think this act leaves a defendant in an action *ex delicto* to stand as he would have stood prior to the passage of the exemption laws." A defendant in such an action cannot claim the exemption.** But if the injured person should elect to

* Furdon's Dig. 742, § 23.

† Cornman's Appeal, 90 Pa. 254, 257.

‡ Horne v. Horne, 1 Del. 291.

§ Hill v. Johnston, 29 Pa. 362, 363.

|| Pamph. L. 285.

¶ Pamph. L. 755.

** Kenyon v. Gould, 61 Pa. 292; Edwards v. Mahon, 5 Phila. 531.

sue in a different manner in assumpsit, as the form of proceeding is called, to recover for his injury, the wrong-doer could claim the exemption.*

The statute as clearly excludes one against whom an execution has been issued on a judgment, or a forfeited recognizance, in a criminal case, for the proceeding is entirely penal in its character.†

4. As the exemption applies only in the two classes of cases mentioned, contracts and distrains for rent, the question has often arisen, what contracts or contracting parties are included? These questions will be presented in an orderly manner, beginning with non-residents, to whom the exemption has always been denied.‡ But he will not be deprived of his exemption save on the clearest proof of non-residence or fraud.§

By a similar application, a debtor who has moved to another state, though intending to return, cannot claim the exemption.||

5. Likewise a grantor, who has parted with all his interest in his land, cannot claim the exemption should it be sold under a prior judgment against him.¶ And if he has conveyed his real estate, he cannot afterwards claim his exemption from the proceeds of the sheriff's sale, though it is sold as his.** But his right of exemption from the proceeds of a sheriff's sale of a leasehold is not forfeited by disclaiming the title on a constable's levy a long time before.††

6. Nor can a debtor claim the exemption in land which he has conveyed to defraud creditors. If the conveyance is ineffectual against them, he thereby bars himself.‡‡ In like manner, if he conceals and withdraws his personal property from execution, by falsehood and deception, he forfeits his right to the exemption from the proceeds of his real estate.§§ And if he disclaims title to the goods on which the officer has levied to satisfy an execution, he cannot subsequently maintain an action against the officer for selling them, on the ground that they were exempted by law.||||

7. Nor is a mortgagor entitled to the benefit of this exemption. The act does not interfere with express contracts which parties may make;

* *Wireman v. Muller*, 20 W. N. Cas. 20.

† *Commonwealth v. Dougherty*, 8 Phila. 366; *Commonwealth v. Whiteside*, 1 L. Bar, Sept. 25, 1869.

‡ *Snow v. Dill*, 6 W. N. Cas. 330; *Aollom's Appeal*, 6 W. N. Cas. 309, s. c. 2 Penny 136; *McWilliams v. Newlin*, 12 L. Bar 68, s. c. 1 Chester 50. See also *Horne v. Horne*, 1 Del. 261; *Wilkins v. Rubincam*, 15 W. N. Cas. 128; *Linseumayer v. Smythe*, 3 C. C. 400.

§ *McTague v. Rehill*, 2 Montg. 36.

|| *Wilkins v. Rubincam*, 15 W. N. Cas. 128.

¶ *Larkin v. McAnnally*, 5 Phila. 17.

** *Markley v. Spires*, 3 Montg. 10, s. c. 2 Pa. Co. Ct. Rep. 424. See *Baker v. Johnson*, 2 Id. 414.

†† *Dunn v. O'Connor*, 2 Leg. Rec. 230. See *Lorenz v. Wright*, 6 W. N. Cas. 539.

‡‡ *Huey's Appeal*, 29 Pa. 219; *Dieffenderfer v. Fisher*, 3 Grant 30; *Carl v. Smith*, 8 Phila. 569; *Strouse v. Becker*, 38 Pa. 190; *Markley v. Spires*, 2 Pa. Co. Ct. Rep. 424.

§§ *Imhoff's Appeal*, 119 Pa. 350, affg. *Miller v. Imhoff*, 2 Lehigh Valley 421.

|||| *Gilleland v. Rhoads*, 34 Pa. 187; *Engle v. Harrington*, 4 Luz. Leg. Obs. 40.

furthermore, a mortgage is a waiver of the rights of exemption. The judgment in such a case is simply a record of the breach of the contract and authorizes a sale of the pledge. It establishes no debt against the mortgagor for which an execution can issue against his goods and lands generally. "We do not suppose," says the court, "that such a judgment was in the legislators' minds when the statute of 1849 was enacted. If it had been it would have been alluded to as a judgment or a mortgage, but there is no language which can be so interpreted."* Again, when real estate is sold under a judgment which is prior to a mortgage the debtor cannot claim his exemption from the proceeds of the sale.† Finally, he cannot claim the exemption when the proceeds of a sheriff sale would have the effect to reduce the fund applicable to discharge a mortgage.‡

8. Though the mortgagor is not entitled to an exemption under proceedings by the mortgage creditor, his exemption may be claimed against other judgment creditors who have taken no executions.§ The mortgagor's position does not protect a prior judgment creditor from the debtor's exemption.||

So, too, a debtor can claim his exemption on an execution issued on a judgment entered on a bond and warrant of attorney accompanying the mortgage, unless there be an express waiver.¶

Nor does a judgment debtor, by giving to a subsequent creditor a mortgage on a property bound by a judgment, deprive himself of the right of setting up a demand for the benefit of the exemption against the judgment creditor.**

9. An executor who has misappropriated a trust fund is not entitled to an exemption on a process issued by the orphans' court.†† But whenever he is an insolvent debtor of the testator he is entitled to the exemption.‡‡

10. In several other cases exemptions have not been allowed, which may be mentioned. Thus, in ejectment cases the defendant cannot claim the exemption against an execution for costs.§§ Likewise, bail on an appeal from a magistrate is not entitled to the exemption.||||

*Gangwere's Appeal, 36 Pa. 466, 470; McAuley's Appeal, 33 Pa. 209; Morgan v. Moud, 5 Clark, 93; Craig v. Craig, 1 W. N. Cas. 613; Hill v. Johnson, 29 Pa. 362.

† Hufford's Appeal, 10 W. N. Cas. 528.

‡ Emery v. Philips, 38 Leg. Int. 126.

§ Shelly's Appeal, 36 Pa. 373; Hill v. Johnson, 29 Pa. 362; Bower's Appeal, 68 Pa. 126, revsg. 3 Phila. 58; Garrett and Martin's Appeal, 32 Pa. 162. See Johnston and Sutton's Appeal, 25 Pa. 117.

|| Finnegan's Estate, 26 Pitts. L. J. 153.

¶ Twadell v. Rodgers, 37 Leg. Int. 299.

** Laub v. Shollenberger, 1 Wood'd 18.

†† Wood's Estate, 7 W. N. Cas. 84.

‡‡ Wilson's Estate, 1 Del. 170.

§§ Danner v. Fritz, 2 North. 67; contra Taylor's Estate, 48 Leg. Int. 25; Neubert v. Mcullough, 27 Pitts. L. J. 177.

|||| Edwards v. Withrow, 22 W. N. Cas. 576, s. c. 6 Pa. Co. Ct. Rep. 13.

11. Nor is a debtor entitled to the exemption whenever an execution has been issued on a judgment or a replevin bond.* So, also, a judgment entered against a vendor after he has signed articles to sell and before the execution of the deed, is a lien on the land and the vendor is not entitled to the exemption against the same.† Again, a defendant cannot claim the exemption against an execution issued on a judgment for overdue taxes.‡ Nor is a debtor entitled to exemption against a judgment for manual labor, though the judgment was obtained prior to the law of May 17, 1883, which provides “that§ no exemption of property from attachment, levy or sale upon execution, shall be allowed upon judgments for fifty dollars or less obtained for wages for manual labor.”

12. A landlord, in proceeding to obtain possession for non-payment of rent, is not entitled to the benefit of the exemption law.|| Nor can the exemption be claimed when the judgment is for damages obtained in proceedings to recover possession by the landlord under the act of 1863.¶

13. Nor can joint-owners of a chattel distrained for rent under a joint demise claim the benefit of the exemption.** But when a joint execution is issued against two, and a levy is made on the individual property of one, he is entitled to the exemption.††

14. So, also, several partners cannot claim the benefit of the exemption from partnership property.‡‡ But in an account rendered by one partner against another the defendant may claim the exemption.§§

15. The exemption does not operate against a mechanic's lien.|||| Nor to a lien for paving.¶¶

16. In an action against a constable for official misconduct he is not entitled to the benefit of the exemption.***

17. We will next consider the doubtful cases in which the exemption has been claimed and sustained. First, it may be remarked, that a minor is not barred of his right of exemption until he comes of age.†††

18. If a wife should claim the property on which a levy had been made, and afterwards disclaim the same, her husband's right to exemption would not be barred.‡‡‡ Nor is the right of exemption from the

* *Pierce v. Lewis*, 9 Pa. Co. Ct. Rep. 250.

† *Godshalk v. Bailey*, 4 Montg. 211.

‡ *McKee v. Christman*, 103 Pa. 431.

§ *Van Wye v. Harrington*, 1 Pa. Co. Ct. Rep. 272.

|| *Williams v. Sheridan*, 7 Luz. Leg. Reg. 14.

¶ *Smith v. Carter*, 42 Leg. Int. 100.

** *Bonsall v. Comley*, 44 Pa. 442.

†† *Spade v. Bruner*, 72 Pa. 57.

‡‡ *Clegg v. Houston*, 1 Pa. 352.

§§ *McTague v. Rehill*, 2 Montg. 35.

|||| *Lanck's Appeal*, 24 Pa. 426; *Building Association v. O'Connor*, 3 Phila. 452.

¶¶ *Hartman v. Holstein*, 2 North 49.

*** *Kirkpatrick v. White*, 29 Pa. 176.

††† *Wireman v. Mueller*, 20 W. N. Cas. 20.

‡‡‡ *Allemong v. Passmore*, 14 W. N. Cas. 124.

proceeds of a sheriff's sale of a leasehold forfeited by a disclaimer of title on a constable's levy a long time before.*

19. In an action of debt for rent collected for a landlord, the defendant is entitled to the exemption.† But a tenant cannot claim the benefit of the exemption law from the proceeds of land purchased subject to the judgment.‡

20. Tenants in common, who are housekeepers in common, maintaining a common family relation, are entitled to an exemption.§

21. A distributee in partition is entitled to his exemption as against liens filed against his interest in the property.||

22. It has also been decided that a fraudulent debtor under the act of March 17, 1869, is entitled to his exemption, and the claim may be made by his wife in his name.¶

23. In an action of *ex contractu* begun by attachment under the act of 1869, the debtor is entitled to the benefit of the exemption law. But a plaintiff in an action of *ex contractu* who fails to recover, is not entitled to the benefit of the exemption against the judgment. It is not founded on contract.**

24. With respect to a garnishee in an attachment, he is entitled to the benefit of the exemption on an execution against him.†† A debtor is also entitled to his exemption from a fund attached in the hands of a garnishee.‡‡

In *Jones v. Tracy*, §§ under an attachment execution, the debtor duly claimed his \$300.00 exemption. The money had been garnished. The garnishee suffered judgment by default for want of an appearance. It was decided that the debtor could not be affected by the garnishee's failure to appear. It was not for the debtor to prevent judgment by default against the garnishee. In other words, the conduct of the garnishee could not, in any way, impair the debtor's right of exemption.

25. Passing now to the costs of execution, it may be remarked that the debtor's exemption is entitled to priority over them.|||| And also on an execution for costs in the orphans' court.¶¶

26. On some occasions the question has arisen, when the debtor wishes to avail himself of the exemption, at what time must he make known

* *Dunn v. O'Connor*, 2 Leg. Rec. 230; *Lorenz v. Wright*, 6 W. N. Cas. 539.

† *Bank v. Zeigler*, 4 Culp. 407.

‡ *Eberhart's Appeal*, 39 Pa. 509.

§ *Delliker's Estate*, 3 Del. 357.

|| *Reed v. Hollebaugh*, 3 Pa. Co. Ct. Rep. 20.

¶ *Pearce v. Landenberger*, 40 Leg. Int. 259; *Ashworthy v. Addy*, 7 W. N. Cas. 342; *Washburn v. Baldwin*, 10 Phila. 472.

** *Strohecker v. Buffington*, 1 Pearson 124. See *Lane v. Baker*, 2 Grant 424.

†† *Fisher v. Elliott*, 33 Leg. Int. 140.

‡‡ *Holme v. Pettingill*, 4 W. N. Cas. 495.

§§ 75 Pa. 417.

|||| *Hain v. Rhodes*, 7 Pa. Co. Ct. Rep. 568; *McCloskey v. Moulder*, 8 Id. 156.

¶¶ *Tatlor's Estate*, 48 Leg. Int. 25; contra *Danner v. Fritz*, 2 North 67.

his wish or intention. In general, it may be said, that he must do this within a reasonable time.* The supreme court have declared that this must be done at the term to which the attachment execution is returnable. The debtor is not required to claim the exemption to the officer who serves the attachment execution. But he must "make his claim during the term when he should appear to answer the writ."† But his claim must not be made later than the return day,‡ or at least the term to which the writ is returnable.§

When, however, the debtor in an attachment execution who has not been served with the process makes his claim for the exemption as soon as he has notice of the execution, and before the plaintiff has done anything to his own detriment, the claim is in time though not made at the term to which the writ is returnable.||

With respect to a notice to the garnishee of a claim of exemption, this is in time if made before the filing of the plaintiff interrogatories.¶ But if the claim is made on filing the answers this is too late.** So, also, would be a notice after judgment against a garnishee.†† And if the defendant and garnishee in an attachment should plead *nulla bona* it would be too late on the trial to claim that the property attached was exempt by law.‡‡

In one case an attachment execution was not served, but the debtor having obtained information of the writ appeared at once and claimed his exemption. He was held to be in time, though the answers of the garnishee had been already filed.* But after judgment against a garnishee in an attachment execution, the debtor is too late to claim his exemption.|||| So, also, after an order of the orphans' court for payment to an attaching creditor to which there is no exception, the debtor is too late to claim the benefit of the exemption.¶¶ So, also, if the defendant and garnishee in an attachment had pleaded *nulla bona*, that they had no

* Strouse v. Becker, 44 Pa. 206, s. c. 38 Pa. 190; Zimmerman v. Briner, 50 Pa. 535; Bair v. Steiman, 52 Pa. 423; Waugh v. Burket, 3 Grant 319; Ashton v. Glass, 9 Phila. 510; Rushworth v. Swope, 1 Leg. Gaz. 223; Thomas' Appeal, 69 Pa. 120, 122; Lennig v. Taylor, 18 W. N. Cas. 94.

† Bittinger's Appeal, 76 Pa. 105, 106; Yost v. Heffner, 69 Pa. 68; Landis v. Lyon, 71 Pa. 473; Bancroft v. Parker, 65 Pa. 336; Strouse v. Becker, 44 Pa. 206, s. c. 38 Pa. 190; Holmes v. Pettingill, 4 W. N. Cas. 495; Kuhn v. Bank, 20 W. N. Cas. 230; Gumbuski v. Wilkes, 4 Culp 546; Musser v. Musser, 1 Lanc. 297.

‡ Brown v. Thomas, 3 Culp 146.

§ Seipt v. Stein, 2 Leg. Rec. 259; Harlan v. Haines, 24 W. N. Cas. 84; Malany v. Entriken, 7 W. N. Cas. 374, s. p.; Morris v. Shaffer, 93 Pa. 489. See Building Association v. Wisner, 10 W. N. Cas. 137.

|| Building Association v. Railroad Company, 102 Pa. 220.

¶ Cochran v. Rockhill, 2 Del. 4.

** Pugh v. Bresnahan, 4 Culp. 311.

†† Huber v. Ritter, 2 Montg. 24; Eichart v. Becker, 15 W. N. Cas. 454.

‡‡ Bancord v. Parker, 65 Pa. 336.

§§ Field v. Streeton, 16 W. N. Cas. 457.

|||| Huber v. Ritter, 2 Montg. 24; Eichart v. Becker, 15 W. N. Cas. 454.

¶¶ Downing's Estate, 5 W. N. Cas. 544.

property, it would be too late on the trial to claim that the property attached was exempt by law *

When two processes are issued on the same judgment, for example, an attachment execution and a *fiery facias*, and are running at the same time, the debtor can have his exemption only on one of them.† And if a debtor has been allowed an exemption of \$100.00 against an attachment, he can have an exemption of only \$200.00 more against the concurrent process of *fiery facias*.‡ In like manner a debtor who has had \$300.00 allowed him against a *fiery facias* is not entitled to claim other moneys attached on the same judgment six months afterwards. §

27. "The sheriff, constable or other officer charged with the execution of any warrant issued by competent authority, for the levying upon and selling the property, either real or personal, of any debtor, shall, if requested by the debtor, summon three disinterested and competent persons, who shall be sworn or affirmed, to appraise the property which the said debtor may elect to retain under the provisions of this act, for which service the said appraisers shall be entitled to receive fifty cents each, to be charged as part of the costs of the proceedings; and property thus chosen and appraised to the value of three hundred dollars, shall be exempt from levy and sale on the said execution or warrant, excepting warrants for the collection of taxes."¶

28. "In any case where the property levied upon as aforesaid shall consist of real estate of greater value than three hundred dollars, and the defendant in such (execution) shall elect to retain real estate amounting in value to the whole sum of three hundred dollars, or any less sum, the appraisers aforesaid shall determine whether, in their opinion, the said real estate can be divided, without injury to or spoiling the whole; and if the said appraisers shall determine that the said real estate can be divided as aforesaid, then they shall proceed to set apart so much thereof as, in their opinion, shall be of sufficient (value) to answer the requirement of the defendant in such case, designating the same by proper metes and bounds. All of which proceedings shall be certified in writing by the said appraisers, or a majority of them, under their proper hands and seals, to the sheriff, under-sheriff or coroner, charged with the execution of the writ in such case, who shall make return of the same to the proper court from which the writ issued, in connection with the said writ: *Provided*, That this section shall not be construed to affect or impair the liens of bonds, mortgages or other contracts for the purchase-money of the real estate of insolvent debtors."¶¶

* *Bancord v. Parker*, 65 Pa. 336.

† *Vogelsong v. Beltzhoover*, 59 Pa. 57.

‡ *Battle v. Gibbons*, 4 Del. 193.

§ *Musser v. Musser*, 1 Lanc. 297. See *Robinson v. Fairlamb*, 1 Del. 375; *Register v. Schureman*, 1 Del. 501.

¶ *Purdon's Dig.* 742, § 24.

¶¶ *Purdon's Dig.* 743, § 25.

29. "Upon return made of the writ aforesaid, with the proceedings thereon, the plaintiff in the case shall be entitled to have his writ of *venditioni exponas* as in other cases, to sell the residue of the real estate included in the levy aforesaid, if the appraisers aforesaid shall have determined upon a division of the said real estate; but if the said appraisers shall determine against a division of said real estate, the plaintiff may have a writ of *venditioni exponas* to sell the whole of the real estate included in such levy, and it shall and may be lawful, in the latter case, for the defendant in the execution to receive from the sheriff or other officer, of the proceeds of said sale, so much as he would have received at the appraised value, had the said real estate been divided."*

30. "The provisions of this act shall not take effect until the 4th day of July next, and shall apply only to debts contracted on and after that date."†

31. "It shall be lawful for the sheriff, deputy-sheriff or constable of any county or township, to administer the oath or affirmation required to be administered to appraisers, under the act to which this is a supplement."‡

32. Every person entitled to the exemption provided for in the act entitled "An act to exempt property to the value of three hundred dollars, from levy and sale on execution or distress for rent," approved the 9th day of April, Anno Domini 1849, may elect to retain the same, or any part thereof, out of any bank notes, money, stocks, judgments or other indebtedness to such persons.§

In Peterman's Appeal || he made an assignment for the benefit of creditors of all his property, except so much as might be exempt from levy and sale on execution, which could be selected by him and appraised for the use of himself and family according to law. He selected and received \$99.00 of personal property. The assignee settled the estate, his account was confirmed and the balance distributed to creditors, Peterman having made no further claim. Previously to the assignment his mother had died intestate owning real estate, and his share therein was not included in the assignee's account. In the distribution of the proceeds of the same, he demanded the remainder of the \$300.00. It was held that his demand should have been regarded, though no appraisement had been made of this fund. Peterman had not waived his right to the exemption, having claimed the same as soon as he had a right to demand and receive it out of the funds. It was remarked in reviewing this case that the appraisement of the property which an assignor elects to keep under the exemption laws must be appraised by the appraisers of the assigned estate, but whenever the assignor elects to receive the amount of his exemption in money, no appraisement is

* Purdon's Dig. 743, § 26.

† Purdon's Dig. 744, § 27.

‡ Purdon's Dig. 744, § 28.

§ Purdon's Dig. 744, § 29.

|| 76 Pa. 116.

necessary. The right of the assignor to make the exception depends upon the exemption laws; his right against the assignee depends on the exception in the assignment. His right of selection is not confined to any particular description of property, nor is subject to any condition whatever, and his right to the property, when selected, is complete. The object of making the appraisement is to ascertain and determine its value, and not for the purpose of enabling the assignor to exercise the right of selection. His right to select the amount does not depend on its previous appraisement.

In Larrison's Appeal * under the act of April 14, 1851, the widow of a decedent may elect to keep the \$300.00 exemption as against the creditors of her husband out of any money or evidence of debt belonging to the estate, and in such case there is no necessity for an appraisement.

33. "All sewing machines belonging to seamstresses, in this commonwealth, shall be exempt from levy and sale on execution or distress for rent, in addition to any articles or money now exempt by law."†

34. "The act, entitled 'An act to exempt sewing machines belonging to seamstresses, in this commonwealth, from levy and sale on execution or distress for rent,' approved April 17th, Anno Domini, 1869, shall, from and after the passage of this act, apply to all sewing machines used and owned by private families in this commonwealth: *Provided*, That this act shall not apply to persons who keep sewing machines for sale or hire."‡

35. "All pianos, melodeons and organs, leased or hired by any person or persons residing in this commonwealth, shall be exempt from levy and sale on execution or distress for rent due by such person or persons so leasing or hiring any such piano or pianos, melodeon or melodeons, organ or organs, in addition to any articles or money now exempt by law: *Provided*, That the owner or owners of any such piano, * * * melodeon or organ, or his or their agent, or the person or persons so leasing or hiring the same, shall give notice to the landlord or his agent, that the instrument is leased or hired."§

A leased piano is not exempt unless notice has been given to lessor when the instrument was put in the house, or, at least, before the right of distraint has accrued.¶ Says Mr. Justice Gordon: "The matter then stands thus, the dealer in the wares subject to exemption has it in his power, by notice, not only to relieve his own property from distress, but, also, by a judicious exercise of that power, to prevent injury to the owner of the demised premises. If notice be given when the leased instrument is put upon the demised property, or at a time when there is

* 36 Pa. 130.

† Purdon's Dig. 744, § 30. But in purchasing a sewing machine the exemption may be waived. *Machine Co. v. Hixenbaugh*, 30 Pittsburg Law J. 469.

‡ Purdon's Dig. 744, § 31.

§ Purdon's Dig. 744, § 32.

¶ *McGeary v. Mellor*, 87 Pa. 461.

no rent due, the tenant is hereby prevented from acquiring a false credit, and the landlord is informed that he must look to other goods for the rent of the current quarter, and, failing that, that he may proceed to regain possession of his tenement by the ordinary statutory methods. If, on the other hand, notice be given only after the rent is due, it may happen that the tenant may have received a credit to which he was not entitled, and the landlord may lose, by no default of his own, a lien which lawfully attached upon the goods. Seeing, then, that the former proposition puts neither hardship nor inconvenience upon the dealer, and as it seems also consonant with the legislative intent, we think it should be adopted as the proper construction of the statute.”*

36. “No exemption of property from attachment, levy or sale upon execution, shall be allowed upon judgments for fifty dollars or less, obtained for wages for manual labor.”†

* *McGeary v. Mellor*, 87 Pa. 461.

† *Purdon's Dig.* 744, § 33.

WAGES.

1. Legislation making them a lien on real estate. Priority and extent of the preference.
2. Difficulty in determining for whom the act was intended before the law of 1883.
3. Are farm laborers included.
4. Who are included.
5. Who are not included.
6. The preference secured by the act of 1854 was not taken away by the act of 1872.
7. The persons or companies from whom the preference can be claimed was not extended by the act of 1883.
8. To what persons or companies therefore the act does not apply.
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33. Effect of a voluntary assignment.
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35. Wages may be attached for boarding indebtedness.
36. Wages are not liable to attachment.

1. In 1872 it was enacted that all moneys that may be due, or hereafter become due, for labor and services rendered by any miner, mechanic, laborer or clerk, * [servant girls at hotels, boarding-houses, restaurants, or in private families or other servants and helpers in and about said houses of entertainment, and private houses, porters, hostlers, all per-

*The portion included in brackets was added by the law of 1883.

sons employed in and about livery stables, laundrymen and washerwomen, seamsters and seamstresses, employed by merchant tailors, milliners, dressmakers, clothiers, shirt manufacturers, and clerks employed in stores, hands, laborers, mechanics, printers, apprentices, hired for wages or salary,] from any person or persons or chartered company employing clerks, miners, mechanics or laborers, either as owners, lessees, contractors or under-owners of any works, mines, manufactory or other business, where clerks, miners or mechanics are employed, whether at so much *per diem*, or otherwise for any period not exceeding six months immediately preceding the sale and transfer of such works, mines, manufactories or business, or other property connected therewith, in carrying on said business, by execution or otherwise, preceding the death or insolvency of such employer or employers, shall be a lien upon said mine, manufactory, business or other property, in and about or used in carrying on said business, or in connection therewith, to the extent of the interest of said owners or contractors, as the case may be, in said property, and shall be preferred and first paid out of the proceeds of the sale of such mine, manufactory, business or other property, as aforesaid: *Provided*, That the claim of such miner, mechanic, laborer and clerk, thus preferred, shall not exceed \$200: *And provided further*, That this act shall not be so construed as to impair contracts existing, or liens of record vested, prior to its passage: *And provided further*, That no such claim shall be a lien upon any real estate, unless the same be filed in the prothonotary's office of the county in which such real estate is situated, within three months after the same becomes due and owing, in the same manner as mechanics' liens are now filed.*

In 1849 a law was enacted preferring miners, mechanics and laborers to the amount of \$50.00 before other creditors of their employers.† This law was amended in 1854, and the preference was increased to \$100.00.‡ In 1872 the law was further amended by increasing the preference to \$200.00, and by including more classes of laborers, and in other ways.§ Eleven years afterwards, in 1883, the law was again amended by extending the preference to more classes of laborers. It has already been given in the first paragraph of this section. In other words, it is the law of 1872 including the bracketed portion.

2. Before the last amendment there was much legal controversy to determine what classes of laborers were included by the preference. Since the act of 1883, however, questions of this nature have been less frequent.

3. The most serious question, perhaps, relates to farm laborers, are they included? Contradictory decisions have been rendered, and the

*Purdon's Dig 1698, § 1.

† April 2, 1849, Pamphlet Laws, 337.

‡ April 22, 1854, Pamphlet Laws, 480.

§ April 9, 1872, Pamphlet Laws, 47.

question must remain open until it has been determined by the highest tribunal. In some cases the courts have excluded this class of laborers from the operation of the law.*

4. A laborer who is engaged in hauling coal to a wharf several miles from the mine, and also a clerk who is stationed at the wharf, can claim the preference.† Likewise persons who are engaged in quarrying stone,‡ and a hotel bar tender,§ an assistant clerk in a drug store,|| an employe of a merchant tailor ¶ and a bookkeeper who is employed by a manufacturing firm.**

An employe having an annual salary with a contingent interest of a percentage on the net proceeds, exceeding a certain amount, is entitled to the preference.†† So is a person who canvasses for advertisements and subscriptions to a newspaper, and who reports for the same.‡‡ In like manner a chief workman, who has paid his helper, is entitled to a preference for such payments.§§

5. We may next inquire who remain outside the operation of this act? A postmaster's clerk is not entitled to the preference, as only clerks employed in stores are included.|||| Neither is a clerk employed by a contractor to build a tunnel,¶¶ nor is a laborer employed in cutting saw logs for the owners and driving them to the place of manufacture,*** nor persons who with their own teams haul lumber after it has been manufactured, nor a firm who saws lumber at a fixed price,††† nor a base ball player,‡‡‡ nor employes of a skating rink,§§§ nor a concert saloon singer and dancer.|||||

6. The act of 1854 in some respects was broader than the act of 1872.

* *Schwartz v. Rhoades*, 6 Pa. Co. Ct. Rep. 385; *Jacobs v. Woods*, 14 W. N. Cas. 237; *Boyer v. Rensinger*, 2 North. 335; *Noblett v. Groff*, 4 Del. 37. In the following cases the preference of this class has been established: *Wiand v. Himmelwright*, 8 Pa. Co. Ct. Rep. 663; *Alderfer v. Beyer*, 2 Pa. Co. Ct. Rep. 425, s. c. 2 Montg. 161; *Topper v. Krise*, 3 Lanc. 113, s. c. 1 Pa. Co. Ct. Rep. 257; *Hirsch v. Myers*, 12 L. Bar 112; *Zug's Estate*, 2 Lanc. 108; *White's Estate*, 14 L. Bar 87; *Seble's Estate*, 1 Chest. 52; *Solm's Estate*, 1 Chest. 115; *Brindle v. Lickenberger*, 1 Chest. 485; *Taylor v. Smith*, 1 Chest. 106; *Shields v. Scott*, 1 Chest. 123; *Irving v. Purdy*, 2 Chest. 210; *Fendrick v. Henry*, 5 Pa. Co. Ct. Rep. 265.

† *Banks' Appeal*, 1 Walk 33.

‡ *Periepi v. Frankinfield*, 2 Del. 112.

§ *Weaver v. Wheaton*, 3 Del. 108, s. c. 2 Pa. Co. Ct. Rep. 428.

|| *Thompson v. Wingert*, 14 W. N. Cas. 483, s. c. 4 Culp 217.

¶ *Teets v. Teets*, 6 Luz. Leg. Reg. 19.

** *Parker v. Edwards*, 5 Culp 419.

†† *Scully's Appeal*, 115 Pa. 141.

‡‡ *Union Newspaper Co. v. Gracie*, 7 Pa. Co. Ct. Rep. 188.

§§ *O'Brien v. Hamilton*, 35 Leg. Int. 68.

|||| *Cary v. Ewing*, 7 Pa. Co. Ct. Rep. 1.

¶¶ *Brackenridge v. Keating*, 5 Pa. Co. Ct. Rep. 260; *Pratt's Appeal*, Id. 264, note.

*** *Balcom v. Moon*, 7 W. N. Cas. 219.

††† *Burge v. Comer*, 5 Pa. Co. Ct. Rep. 5.

‡‡‡ See in re Base Ball Association, 3 Culp 23; *Kærcher v. Sullivan*, a Chest. 461.

§§§ *Merriman v. Mullett*, 2 Pa. Co. Ct. Rep. 360.

||||| *Cleveland v. O'Neil*, 4 Pa. Co. Ct. Rep. 148.

By the former act in all assignments of property the wages of the laborers employed by the assignor were to be preferred and paid before other creditors. By the subsequent act only the wages of those who were employed as clerks, miners and mechanics were protected, and thus a large class was excluded. But it has been held that the preference secured by the former act are not taken away by the latter. Says President Judge McClean:* “There is no room or place for inconsistency or repugnancy. The latter statute is not made concerning the same matter, does not introduce new rules on the subject, for it does not touch the subject, and therefore was not intended as a substitute for the former law. The latter act was manifestly to protect the clerks and workmen of those who are engaged in the developing of the great mining and manufacturing industries of the commonwealth.”†

7. In interpreting this statute, it may be remarked that while the act of 1883 extended the preference to more classes of laborers, the persons or companies from whom the preference can be claimed was not extended. Says presiding Judge Mayer in *Balcom v. Moon*. ‡ “While the class of employes by this act are enlarged, no change was made in the class of employers designated in the act of 1872. The act of 1883 still reads, ‘that all moneys that may be due or hereafter become due for labor and services rendered, from any person or persons or chartered company, employing clerks, miners, mechanics, or laborers, either as owners, lessees, contractors, or under-owners, of any works, mines, manufactory, or other business where clerks, miners, or mechanics are employed.’ The money must be due ‘for any period not exceeding six months preceding the sale and transfer of such works, mines, manufactories, or business, or other property connected therewith in carrying on said business. The fund for distribution must be realized out of the sale of such mine, manufactory, business, or other property as aforesaid,’ and the money due must be preferred and first paid out of the proceeds of such sale. It is clear that no change was made in the act of 1883 as to the class of employers, the kind of business in which they must be engaged, and the description of the property to be sold, out of which the labor claims are to be preferred and first paid.”

8. The preference applies, therefore, only to those laborers who are employed by persons or companies either as owners, lessees or contractors. Consequently a person who undertakes the drilling of oil wells, for example, by contract is not an employer or contractor within the meaning of this act, and if he should employ laborers they would not be entitled to the preference. Says Mr. Justice Sterrett: “A proper construction of the act answers both these questions in the negative. The several classes of employers, from whom wages must be due in order to entitle

* *Estate of Gitt*, 35 Leg. Int. 404.

† *Ramsey's Estate*, 1 Chest. 449, s. c. 14 L. Bar 60.

‡ *Pa. Co. Ct. Rep.* 296, 298.

their employes to a lien under the act, are designated therein, 'either as owners, lessees, contractors, or under-owners of any works, mines, manufactory, or other business.' Lewis was clearly neither owner, under-owner nor lessee of the oil well. He had no interest whatever therein, nor was he a contractor within the meaning of the act. The word 'contractors' as used therein is applicable only to persons employed by the owner or lessee of a mine to operate the same, produce the mineral, coal, iron, or whatever it may be, for an agreed compensation, and does not embrace those who undertake to perform some special service in the construction of works, or the opening of mines preparatory to their being operated."*

In Pardee's Appeal† this question was considered in determining whether the cutting of saw-logs for the owners and driving them to the place of manufacture was a business within the meaning of the act. The court decided in the negative, Mr. Justice Sterrett saying: "We are clearly of the opinion that the business of cutting saw-logs and driving them to the place of manufacture is not such as is contemplated by the act of 1872. Its declared purpose is to secure money due, 'for labor and services rendered, by any miner, mechanic, laborer or clerk, from any person or persons, or chartered company, employing clerks, miners, mechanics or laborers, either as owners, lessees, contractors or under-owners of any works, mines, manufactory or other business where clerks, miners or mechanics are employed.' The words, 'works, mines, manufactories,' thus employed in the act, have a definite signification, well understood in a general and popular acceptation. The *ex vi termini* the branches of business intended to be described by them are, in a certain sense, complete and independent, and of a fixed and permanent character, as opposed to a temporary employment that is merely incidental to any particular branch of business. It will scarcely be pretended that either of these words fitly describes the business in which appellant was employed. It is contended, however, that the expression, 'other business,' etc., is sufficiently comprehensive to embrace cutting and driving logs. Perhaps it would, if we were at liberty to construe it without reference to the context; but the preceding words, designating particular branches of business with which the idea of permanency and completeness, in a certain sense, is always associated, must control the meaning of the more general expression used in immediate connection therewith. 'Other business' is *eiusdem generis* with that more particularly described by the preceding words of the context, business of the same general character, not embracing every specie of employment in which the services of others may be rendered."

In another case‡ the court said with reference to laborers, who were

* Gibbs & Sterrett Manufacturing Company's Appeal, 100 Pa. 530.

† 100 Pa. 408, 412.

‡ Llewellyn's Appeal, 103 Pa. 458

temporarily employed in re-building a furnace: "It is admitted that none of these appellants were employed in the manufacture of iron, nor were they engaged in operating the works in any branch or department of the business to which they were especially devoted. The manufacture of pig metal was the particular, permanent and continuous business of the works, and the class of laborers or mechanics, within the meaning of the act, we think, is such as is employed in this business.

In order to start the manufacture of iron it is requisite, first, to construct the buildings, supply the machinery and equip the works; the labor bestowed upon the construction and equipment is merely temporary and preliminary in its character to the general employment for which the works are designed. The construction of a manufactory is one thing, and the operating of it is another; the price of the materials furnished and labor done in the former is preferred, under the mechanics' lien law, whilst the wages of the labor performed, in the latter, is covered by the provisions of the act of 1872."

In White's Appeal* this question again arose in a claim by one for sledding bark and making roads for a person who was engaged in the business of manufacturing lumber, shipping the same and peeling and shipping bark. It was decided that the business contemplated in the act must be connected with works, mines or manufactories, and in a certain sense, complete and independent and of a fixed and permanent character as opposed to a temporary employment.

9. It has been contended that the meaning of the phrase "other business" in this clause of the statute has been enlarged by the amendment of 1883. This is the opinion of Judge Mitchell.† But as the only amendment was in extending the preference to more classes of laborers, what ground exists for such a construction of this phrase?‡

10. The preference covers a period of employment not exceeding six months immediately preceding the sale and transfer of the works, mine, manufactory or business. In interpreting this portion of the statute there has been much conflict of opinion. It has been decided that wages earned after a levy has been made on property, and before its sale, are not entitled to the preference and therefore cannot be paid from the proceeds of the same.§ In *Schrader v Burr*,|| President Judge Pershing said: "If the broad construction claimed for the act of 1872, is the true one, it is plain that an execution creditor upon whose writ a levy has been made of property abundantly sufficient to satisfy his judgment, may yet realize nothing, in consequence of the interposition of liens created after the property was in the custody of the law. Without reference to the words 'by

*15 W. N. Cas. 313.

†Assigned Estate of Clymer Distilling Company, 2 Pa. Co. Ct. Rep. 111.

‡See *Merriman v Mullett*, Id. 360, 362.

§*Kindig v. Atkinson*, 34 Leg. Int. 196; *Schwartz v. Banks*, Id. 250; *Schrader v. Burr*, 10 Phila. 620; *Central Newspaper Union v. Gracie*, 7 Pa. Co. Ct. Rep. 188.

|| 10 Phila. 620, 621.

execution or otherwise preceding the death or insolvency of such employer or employers,' we think the preference given to the wages of labor under the act of 1872, cannot be extended to a time subsequent to the date of the levy. This construction, it seems to us, is alike consonant with reason and authority."* But in some cases the courts have held that the wages earned between the date of the levy and the day of sale were included in the preference,† though they must have been earned within six months immediately preceding the sale.‡

In *Dixon v. Bellefonte Glass Company* § a similar view was taken of the statute, especially whenever the sheriff has not taken actual possession of the property and the wages are earned in a manufacturing establishment. Says President Judge Furst: "We think there is a marked distinction to be observed between a levy upon a manufacturing establishment, such as glass works in operation, and a levy upon other personal property not connected or used or valuable to the manufactory. In the former case the personal property is only valuable in connection with the operation of the works; in the latter case the value of the personal property is not affected by its relation to the manufactory, but is independent thereof. In this latter case the sheriff could take actual possession of the property at the time of the levy; it would then be in the custody of the law, and there would be no necessity to employ laborers. Such actual taking might be considered as the date of the transfer, but not of sale. But, in the former case, where no actual possession is taken by the sheriff at the time of levy, and the property permitted to remain in the actual possession of the owner until sale, the sheriff has, until sale, but a constructive possession, which cannot be considered in any case as equivalent to a transfer or sale. In such case, if not in every case, the wording of the act of assembly should be followed, which limits the lien of the laborer to the day of sale. We think the day of sale must be regarded as the true limit from which to reckon the preference for wages of labor in all cases where the possession of the owner is not disturbed or transferred to the sheriff. If the sheriff took actual possession, we can readily see why the lien might cease, as then the contract of the laborer would terminate, and no new contract could be made by the sheriff which would create a lien for wages of labor."

When the work is done for an assignee, and after a levy which was previous to the assignment, the laborer is not entitled to a preference.¶

* *Graham v. McLean & Bennor Machine Co.*, 1 Chest. 73, s. c. 35 Leg. Int. 70.

† *Nogle v. Cumberland Ore Bank Co.*, 1 Chest. 491; *Brandon v. Davis*, 2 Leg. Rec. 142; *Matsinger v. Covenant Pub. Co.*, 14 W. N. Cas. 90; *Askam v. Wright*, 1 W. N. Cas. 156; *McCuttle v. Fitzgerald*, 2 W. N. Cas. 396; *Keeler & Co. v. Beeshline*, 1 Pa. Co. Ct. Rep. 287.

‡ *Keeler & Co. v. Bershline*, 1 Pa. Co. Ct. Rep. 287; *Gray v. Krugerman*, 4 Pa. Co. Ct. Rep. 290.

§ 7 Pa. Co. Ct. Rep. 234.

¶ *Roberts' Appeal*, 110 Pa. 325.

"If," said the court, "the claimant was employed by the assignee, it was the business of the assignee to pay him, and charge the amount thus paid to his account as part of the expenses incident to the administration of the trust, but his liability to the laborer, whom he had employed, was as much personal as though he had employed him about his own business." It is somewhat remarkable that this question has not reached the supreme court. Until it is answered by that tribunal it must be regarded as a doubtful one unless it is settled by the legislature. The supreme court, however, have decided that if wages have been earned by a laborer six months before the sale of the employer's property, and another sum within that period, and he has been paid a considerable sum within that period without a specific application for the same, the laborer may apply the payment to the older earnings and claim his two hundred dollars preference for labor performed during the latter period.*

11. The preference of laborers is not affected by the fact of their owning stock in the company for which they labor.†

12. The preference has priority over the landlord's claim for rent.‡ But it does not have priority over a judgment entered before the work was performed.§

13. The preference extends to every kind of property of the employer.¶ If the employer is a farmer, the proceeds of a growing crop of wheat is properly applicable to the payment of wages in preference to a judgment lien on the land.¶ If he is a manufacturer, the preference may be claimed for the proceeds of any personal property, and not merely that connected with the manufactory.** In partnership cases, however, the preference against the firm does not extend to the private property of the individual partners which is not connected with the business.†† Nor is the preference claimed against a firm after an individual assignment by a member valid against the assigned estate of the latter.‡‡ But when land is sold as firm property, though the title stands in the name

* Wagner's Appeal, 103 Pa. 185.

† National Bank v. Oxford Co-operative Car Co., 2 Pa. Co. Ct. Rep. 360.

‡ Kemble Coal & Iron Co.'s Appeal, 114 Pa. 58, affg. 2 Pa. Co. Ct. Rep. 197; O'Brien v. Hamilton, 35 Leg. Int. 68; Edge v. Marsh, 1 Chest. 524; Maloy's Estate, 1 Del. 331; Central Newspaper Union v. Gracie, 7 Pa. Co. Ct. Rep. 188; Periepi v. Franklinfield, 2 Del. 112; Woodmancie v. Boyer, 2 Lanc. 365. See Coal Company's Ap. Estate, 7 Luz. Leg. Reg. 19; Nogle v. Cumberland Ore Bank Co., 1 Chest. 491.

§ Schnapp's Appeal, 2 W. N. Cas. 149, s. c. Pitts. L. J. 37.

¶ Hartman's Appeal, 107 Pa. 327; Reed's Appeal, 18 Pa. 2351; Pattison's Appeal, 61 Pa. 294; Firth v. Preston, 1 Chester 517, 521.

¶ Firth v. Preston, 1 Chest 517; Reiff v. Reiff, 64 Pa. 134, Bausman & Herr's Appeal, 90 Pa. 178.

** Evan's Estate, 1 Chest. 112.

†† Hartman's Appeal, 107 Pa. 327, Ward's Appeal, 32 P. F. Smith 270; King v. King, 2 W. N. Cas. 201; Beatty's Appeal, 3 Grant 213. See Bowers v. Bowers, 1 Chest. 273.

‡‡ Fox's Appeal, 11 Atlantic 228.

of one of the partners, the wages of laborers employed by the firm are entitled to the preference over the claims of creditors of an individual partner who loaned their money on the faith of his ownership.* And, likewise, insurance which is claimed by one partner, which was effected for the benefit of the firm name, and in its name, must be treated as its assets, and wage claimants are entitled to the preference in the same.†

14. When property has been burned, the policies of insurance thereon are not liable to the preference of employees.‡ Nor is grass grown on the land after the payment of wages has accrued, nor old machinery.§ And when the enterprise in which the laborers had been engaged is ended, and the property connected therewith is removed in good faith by the owners from the place where the labor was performed, the laborers cannot claim the preference against an execution creditor of the owner.||

15. A claim for wages may be sold and assigned, and the assignee becomes invested with all the rights of the original claimants.¶ And a minor may assign his claim like any other person.**

An assignment of wages earned more than six months prior thereto is not entitled to the preference.††

Notes given by the laborer to the assignee of wages certificates operate as a release of the preference lien.‡‡

16. "In all cases of execution, landlords' warrants, attachments and writs of a similar nature, hereafter to be issued against any person or persons, or chartered company, engaged as before mentioned, it shall be lawful for such miners, laborers, mechanics or clerks, to give notice in writing of their claim or claims, and the amount thereof, to the officers executing either of such writs, at any time before the actual sale of the property levied on; and such officers shall pay to such miners, laborers, mechanics and clerks, out of the proceeds of sale, the amount each is justly and legally entitled to receive, not exceeding \$200."§§

In Adamsom's Appeal||| Mr. Justice Sterrett thus set forth the law relating to the sufficiency of the notice: "The law under which appellees claim is a species of class legislation, and it is not unreasonable to require that all the facts necessary to bring their respective claims within the provisions of the act should be stated in the notices they are required to serve on the sheriff. This is not only reasonable, but essen-

* Strickler's Appeal, 10 W. N. Cas. 535.

† Firth v. Preston, 1 Chester 517.

‡ Jones' Appeal, 102 Pa. 285.

§ Id.

|| Pardee's Appeal, 100 Pa. 408.

¶ O'Brien v. Hamilton, 35 Leg Int. 68.

** Wolf's Appeal, 1 Walk. 451.

†† Buckwalter's Estate, 3 Pa. Co. Ct. Rep. 315.

‡‡ Montgomery's Appeal, 5 Central 200.

§§ Purdon's Dig. 1698, § 2.

||| 110 Pa. 459.

tially necessary in order that the officer, as well as the execution creditors and others interested, may act understandingly. The act, it is true, does not prescribe any particular form of notice, but in *Allison v. Johnson et al.*,* we said it should be sufficiently full and clear to show the officers and others interested that the labor was performed within the time limited by the act, in a business defined therein, the sum due, and that the property subject to the preferred lien is embraced in the levy. These four ingredients are necessary to bring a claim within the protection of the statute, and hence they must appear in some form in the notice served on the sheriff."

17. To take advantage of this statute, the claimant must give notice in writing of his preference prior to the sale, to the sheriff who is to conduct it. Many questions have arisen concerning the sufficiency of this notice. Not infrequently the description of the claim has been deemed insufficient. In the following note reference is made to some of these cases.†

18. The form of the notice is immaterial, but it should contain enough to show the officers and others interested that the labor was performed within the time limited by the act, and in the business defined therein, the sum due, and that the property subject to the preference is embraced in the officer's levy.‡

Without describing more fully the utterances of the court on different occasions concerning the sufficiency of notices, we will refer to the following cases:§

A notice that is reasonably certain satisfies the law. It is not necessary for the claimant to make oath to his claim, but this is the usual practice.||

19. We will now describe the cases in which the courts have decided that the notice contained an imperfect description of the claim. In one of the cases the claim was for "labor and services about the works and connected therewith." This was deemed insufficient.¶ If the notice fails to state that the property subject to the lien is embraced in the levy it is fatally defective, and cannot be supported by oral testimony.**

* 11 Norris 314, and Pardee's Appeal, 4 Out. 408.

† Livengood's Appeal, 17 W. N. Cas. 420; *Allison v. Johnson*, 92 Pa. 314; *Bank v. Childs*, 10 Phila. 452; *Stichler v. Malley*, 94 Pa. 2; *Shields v. Scott*, 1 Chest. 123; *Peiffer's Estate*, 6 Luz. Leg. Reg. 101.

‡ Pardee's Appeal, 100 Pa. 408.

§ *Hoffacker v. Hoffacker*, 2 Leg. Rec. 153; *Brandon v. Davis*, 2 Leg. Rec. 142; *in re Hunt*, s Culp 479; *Schwartz v. Dannehower*, 2 Montg. 19; *Bright v. Osterman*, 1 Pa. Co. Ct. Rep. 148; *Robert's Appeal*, 110 Pa. 325; *Shives v. Clouser*, 4 Pa. Ct. Rep. 149; *Weaver v. Wheaton*, 3 Del. 158; *Alderfer v. Beyer*, 2 Pa. Co. Ct. Rep. 425; *Kindig v. Atkinson*, 34 Leg. Int. 196; *McMillen v. Bank*, 1 W. N. Cas. 55; *Bennett's Estate*, 7 Luz. Leg. Reg. 2; *Graham v. McLean & Bennor Machine Co.* 35 Leg. Int. 70; *Bank v. Christman*, 2 Pearson 248; *Crater v. Deemer*, 1 North. 112; *Whitney v. Cope*, 8 Pa. Co. Ct. Rep. 560.

|| *Brown v. McFadden*, 6 Pa. Co. Ct. Rep. 9.

¶ *Pepper's Appeal*, 2 Penny. 113.

***Crater v. Deemer*, 4 Pa. Co. Ct. Rep. 375.

Likewise, a notice which does not set forth when the work was done, and especially omitting to state that it was done within the time limited by the act, is fatally defective.* In like manner, a notice without referring to the property to be sold, or claiming a lien thereon, or a right to be paid from the proceeds of the sale, is defective.† And if a lien is claimed for quarrying and dressing flag-stones in one place, it will not embrace work done in laying flag-stones at another.‡ Likewise, a notice which does not describe the business as coming within the statute, or the nature or kind of labor, or that the property seized was used in the defendant's business, is insufficient.§

20. Again, defects in the notice cannot be cured by amendment, supplementary notice or affidavit.|| And certainly such an amendment cannot be made after the sale.¶

21. The notice to the sheriff can be given by an attorney at law or properly authorized agent.**

22. A notice of a claim by a husband and wife may be included in one notice signed by the husband.††

23. This claim need not be filed in the office of the prothonotary. The act of 1872, making such a provision, was repealed two years afterwards and the provision was not re-enacted by the law of 1883.‡‡

"In all cases of the death, insolvency or assignment of any person or persons, or chartered company, engaged in operations as hereinbefore mentioned, or of executions issued against them, the lien of preference mentioned in the first section of this act, with the like limitations and powers, shall extend to every property of said person or chartered company." §§

We have already stated what property is included in this statute. The subject was well considered in *Ferth v. Preston*,||| in which the question was whether the proceeds of crops growing at the time of the debtors assignment was included, and should be awarded as a preference to the debtor's laborers, instead of the judgment creditors. After answering this question in the affirmative the court remarked: "the act of 1872 is broad enough to cover property of this character. It is evidently an enlargement and extension of the act of April 2, 1849,¶¶ and the act

* *Brown v. Brown*, 1 Lehigh Valley. 167.

† *Irvings v. Purdy*, 2 Chest. 210.

‡ *Lantz v. Post*, 2 Pa. Co. Ct. Rep. 481.

§ *Zealberry's Appeal*, 3 Central 253.

|| *Zealberry's Appeal*, 3 Central 253; *Newgrass v. Aerskowiz*, 4 Culp 431; *Crater v. Demmer*, 4 Pa. Co. Ct. Rep. 375.

¶ *Newgrass v. Herskowitz*, 4 Culp 431.

** *Ulrich v. Feaser*, 2 Lanc. 25.

†† *Wiand v. Himmelwright*, 8 Pa. Co. Ct. Rep. 663.

‡‡ *Rodgers v. Iron Works*, 17 W. N. Cas. 444.

§§ *Purdon's Dig.* page 1699, § 3.

||| 1 Chest. 517, 521.

¶¶ Pamphlet Laws 337.

of March 30, 1859,* relating to Schuylkill and other counties. It was held in Reed's Appeal,† that the preference under the act of 1849, was not limited to the personal property about the works where the laborers were employed, but extended to the personal property generally of the employers; and in Vastine's Appeal,‡ wages were given a preference over execution creditors. The third section of the act of 1872, provides that in the case of the death, insolvency or assignment of any person or chartered company engaged in the operations mentioned in the act, the lien of preference mentioned in the first section, with the like limitations and powers, shall extend to every property of such person or chartered company. We think this section was intended to extend the preference, in the cases therein mentioned, 'to every property,' without regard to its character, and that the expression 'lien of preference' was not intended to limit it to certain classes or kinds of property. The property of the employer, whether in the shape of chattels or securities, is all within its scope, and, as appears to the court, its plain intent. The purpose of the law makers was to secure to the class of employes, therein named, their wages, by preferring them in the distribution of their employer's estate over every other creditor, with the limitations therein provided; and this purpose would be defeated if the character of property, out of which this preference is given, is limited to that which will admit of sale in the ordinary sense of the term. It may frequently happen that the greater part of the employer's property, on his failure, may be in the shape of indebtedness to him, perhaps for the very goods upon which the labor of the operatives has been bestowed. The earnings of the laborer go to increase the general estate of their employer, and their claim under the act is equally good against every part of it.§"

But the extension of the lien to all property of the decedent does not apply to an employe in his business which is conducted in another state.||

25. "No mortgage, or other instrument by which a lien is hereafter credited (created) shall operate to impair or postpone the lien and preference given and secured to the wages and moneys mentioned in the first section of the act: *Provided*, That no lien of mortgage or judgment entered before such labor is performed, shall be affected or impaired thereby."¶

26. "The proviso to the fourth section of an act, entitled 'An act for the better protection of the wages of mechanics, miners, laborers and others,' approved the 9th day of April Anno Domini 1872, shall not hereafter be so construed as to, in any manner, apply to coal-lease mort-

* Pamphlet Laws 318.

† 18 Pa. 235.

‡ 38 Pa. 164.

§ Reed's Appeal, *supra*.

|| Hotz's Estate, 16 W. N. Cas. 351

¶ Purdon's Dig. 1699, § 4.

gage or mortgages, or to make the same a lien preferred to the lien of the wages of labor mentioned in said act, but that such claim of wages shall be a lien preferred thereto."*

27. "It is the true intent and meaning of the provisions of the act of assembly, entitled 'An act for the better protection of the wages of mechanics, miners, laborers and others,' passed the 9th day of April, Anno Domini 1872, that the several classes of laborers in said act mentioned shall have a preference over landlords, in all claims for rent of any mines, manufactories or other real estate, held under lease, where the lessee or lessees are the parties employing the miners, mechanics, laborers or clerks: *Provided*, That any person or persons claiming a preference as above provided, shall give notice of the nature and amount of his claim to the landlord or his bailiff, before the actual sale of the property levied on."†

28. "In all cases now pending, or which may hereafter be brought, before any court of this commonwealth, for the recovery of the wages of manual labor only, it shall be the duty of the prothonotary preparing the list of civil causes, to place all claims for the wages of labor first on the list, and the court shall proceed to try all such cases as they occur on the list: *Provided*, That a statement of the plaintiff's claim be filed in such cases, showing that the claims respectively are for manual labor alone."‡

29. "No stay of execution shall be allowed on any judgment for one hundred dollars and less, when the same has been recovered for wages of manual labor."§

30. "No exemption of property from attachment, levy, or sale upon execution, shall be allowed upon judgments for one hundred dollars or less, obtained for wages for manual labor."||

31. "In all cases of appeal from the judgment of justices of the peace, for wages or moneys mentioned in the first section of this act, the party appellant, his agent or attorney, shall make oath or affirmation, that it is not for the purpose of delay that such appeal is entered, but because he firmly believes injustice has been done. The bail required in cases of appeal from the judgments of justices of the peace, and from the awards of arbitrators, for the wages and moneys mentioned in the first section of this act, shall be bail absolute in double the amount of said judgment and awards, and the probable amount of costs accrued and likely to accrue in such cases, with one or more sufficient sureties, conditioned for the payment of the amount of the debt, interest and cost that shall be legally recovered in such case against the appellant."¶

* Purdon's Dig. 1699, § 5.

† Purdon's Dig. 1699, § 6.

‡ Purdon's Dig. 1699, § 7.

§ Purdon's Dig. 1698, § 8.

|| Purdon's Dig. 1699, § 9, amended March 4, 1887, Pamphlet Laws page 4, 1887.

¶ Purdon's Dig. 1699, § 10.

32. "In all cases in which judgment shall have been rendered by any justice of the peace or alderman in this commonwealth for wages of manual labor, before the defendant shall be entitled to an appeal from the judgment of the justice or alderman, he, or his agent or attorney, shall make oath or affirmation that the appeal is not intended for the purpose of delay, but that he believes that injustice has been done him, which affidavit shall be attached to and sent up with the transcript of appeal. And the said defendant shall be required to give good and sufficient bail for the payment of the debt and costs, to be paid when finally adjudged to be due the plaintiff by the court, in all cases for labor." *

33. "No voluntary assignment for the benefit of creditors so as to hinder, delay or prevent, longer period than thirty days from the time of such assignment, the collection or enforcement of any of the claims for the wages of labor secured and protected by the act for the better protection of the wages of mechanics, miners, laborers and others, approved the 9th day of April, 1872, or its supplements; and said claimants may, after the expiration of thirty days from the date of such assignment, enforce the collection of their claims, in the same manner, and by means of the same remedies that they might have done had no such assignment been made."

34. "In all cases of voluntary assignments heretofore made and now remaining unsettled, and in which the assignee or assignees has or have more than five months within which to settle his or their account or accounts, any or all of the claimants protected by the provision of the aforesaid act, or its supplements, may, immediately after the passage of this act, proceed to collect such claims just as though no such assignment had been made; and in case such assigned property has already been sold, and the assignee or assignees refuse to pay such claimants the amount legally due them, they shall have the right to compel him or them to file his or their account, and may proceed to have such claims paid, by a distribution through an auditor or auditors according to law: *Provided, however,* That the owner or owners of such assigned property, or the assignee or assignees, or any interested party, may pay to such claimants the amount of the claims so protected by said act or its supplements, and be subrogated to the rights of the claimants to the extent of such payments." †

35. "All proprietors of hotels, inns, boarding-houses and lodging houses in this commonwealth, in addition to the remedies now provided by law, shall have the right to attach wages due or owing to such persons as may be indebted to them for boarding, not exceeding the amount of four weeks, and any sum so due may be attached, but shall not be paid to the defendant until the judgment so had for such amount as

* Purdon's Dig. 1699, § 11.

† Purdon's Dig., page 1,700, §13.

may be due upon such attachment shall be satisfied; and justices of the peace shall have jurisdiction of attachment in case for such purpose.”* This act, however, does not deprive the laborer of the \$300.00 exemption provided by law. This has been decided on several occasions. On one of these,† this question was settled by the supreme court.‡

36. “The wages of any laborers or the salary of any person in public or private employment, shall not be liable to attachment in the hands of the employer.”§ This is a general law and applies to all judgments. This act was constructed in the following case. A. agreed orally to sell and convey to B. a lot of ground, and the purchase money was to be paid in the form of labor. In settling between the parties A. owed B. for wages a sum which was to be credited on account of the purchase money of the lot. Subsequently A. repudiated the contract and conveyed the lot to a third person who obtained the same by legal proceedings. It was held that the amount owing by A. to B. was wages money and are not liable to attachment.||

In another case it was decided that the wages of a miner, who by his own labor mines coal at a fixed price per ton, and employs a common laborer to assist him who is to be paid a daily compensation, cannot be attached.¶

This provision of the law applies to all judgments whether entered in the common pleas or on the docket of the justice of the peace.**

*Purdon's Dig., 891, § 23.

†Smith v. McGinty, 101 Pa. 402.

‡See also Gentey v. Keefe, 8 Luz. Leg. Reg. 179; Blythan v. Rescoral, 1 Culp 351; Higgins v. Peck, 1 Lac. Jur. 39.

§ Purdon's Digest, 746, title execution, section 40, act of April 15, 1845, section 5, pamphlet laws 460.

|| Scott v. Watson, 36 Pa. 342.

¶ Pennsylvania Coal Co. v. Costello, 33 Pa. 241.

** Catlin v. Ensign, 29 Pa. 264.

PAYMENT, ASSIGNMENT AND RECOVERY OF WAGES.

1. Priority of wages.
2. Wage-workers are to be paid in money semi-monthly in full, and liability for neglect or refusal.
3. Assignment of future wages.
4. Actions may be brought by the factory inspector.
5. They are entitled to notices of intention to discharge except for incapacity or misconduct or general suspension of labor.
6. Suits for recovery for wages.
7. Lien for wages.

1. In 1892 the legislature enacted "that all moneys that may be due or hereafter become due for labor and services rendered by any miner or mechanic, servant girl at hotels, boarding houses, restaurants or in private families, or any other servant and helper in and about said houses of entertainment and private families, porter, hostler or any other person employed in and about livery stables or hotels, laundryman or washerwoman, seamster or seamstress employed by merchant tailors or by any other person, milliner, dressmaker, clothier, shirtmaker or clerk employed in stores or elsewhere, hand laborer, including farm laborer or any other kind of laborer, printer, apprentice, and all other tradesmen hired for wages or salary from any person or persons, chartered company, joint-stock company, limited partnership or other partnership, either as owner, lessee, contractor or under-owner, whether at so much per diem or otherwise, for any period not exceeding six months preceding the sale or transfer of the real or personal property, works, mines, manufactories or business or other property connected therewith in carrying on the same of said person or persons, chartered company, joint-stock company, limited partnership or other partnership, by execution or otherwise, on account of the death or insolvency of such employer or employers, shall be a lien upon said real or personal property, mine, manufactory, business or other property in and about, or used in carrying on said business or in connection therewith, to the extent of the interest of such employer or employers in said property, and shall be preferred and first paid out of the proceeds of the sale of such real and personal property, mine, manufactory, business or other property as aforesaid: *Provided, however,* That the claim thus preferred shall not exceed two hundred dollars: *And provided further,* That this act shall not be so construed as to impair contracts existing or liens of record vested prior to its passage: *And provided further,* That no such claim shall be a lien upon any real estate, unless the same be filed in the prothonotary's office of the county in which such real estate is situated, within three months after the same becomes due and owing, in the same manner as mechanics' liens are now filed."*

* Act of May 12, 1891, Pamphlet Laws, page 54, amending act of April 9, 1872, Pamphlet Laws, 1872, page 47.

2. "From and after a period of two months, subsequent to the date of the passage of this act, every individual, firm, association or corporation employing wage-workers, skilled or ordinary, laborers engaged at manual or clerical work, in the business of mining or manufacturing, or any other employes, shall make payment in lawful money of the United States to the said employes, laborers and wage-workers, or to their authorized representatives; the first payment to be made between the first and fifteenth, and the second payment between the fifteenth and thirtieth of each month, the full net amount of wages or earnings due said employes, laborers and wage-workers upon the first and fifteenth instant of each and every month wherein such payments are made. And in case any individual, firm, corporation or association or other employer, shall refuse to make payment when demanded, upon the dates herein set forth, to wage-workers, laborers or other employes employed by or with the authority of such individual, firm, corporation or association or other employer, the said individual, the members of the firm, the directors, officers and superintendents or managers of said corporation and associations, shall be guilty of a misdemeanor, and upon conviction shall be sentenced to pay a fine not to exceed two hundred dollars.

3. No assignment of future wages payable semi-monthly, under the provisions of this act, shall be valid, nor shall any agreement be valid that relieves the said firms, individuals, corporations or associations from the obligation to pay semi-monthly, and in the lawful money of the United States.

4. It is hereby made the duty of the Factory Inspector and his deputies to bring actions in the name of the commonwealth, against every individual, firm, corporation and association violating the provisions of this law, upon the request of any citizen of this commonwealth. Upon his failure to do so, any citizen of this commonwealth is hereby authorized to do so in the name of the commonwealth.*

5. From and after the passage of this act, any individual, partnership or corporation, who or which requires from persons in his or its employ, under penalty of forfeiture of part of wages earned by them, a notice of intention to leave such employ, shall be liable to pay to the party injured a sum equal to the amount of said forfeiture, if he or it discharges, without similar notice, a person in such employ, except for incapacity or misconduct, unless in case of a general suspension of labor in his or its mine, shop or factory, or a suspension of work ordered by the employes of such individual, partnership or corporation.

6. Suit may be brought by any person or persons interested under the provisions of the first section of this act before any of the magistrates or justices of the peace of this commonwealth having jurisdiction

* Section three is the law of 1887 (Pamphlet Laws, 1887, page 1880) ; amended in 1891 (Pamphlet Laws, 1896, page 96). Sections four and five are the law of 1891, page 96.

for the recovery of the sum or sums of money as are required to be paid by the employer or employers under the first section of this act.*

7. No such claim shall be a lien upon any real estate unless the same be filed in the prothonotary's office of the county in which such real estate is situated, within three months after the same becomes due and owing, in the same manner as mechanics' liens are now filed; and that it shall be lawful to issue a *scire facias* on any lien, which has been or hereafter may be filed, as aforesaid, and to proceed thereon to judgment, execution and sale, in the same manner as a *scire facias* is now issued on a mechanics' lien and proceed on to judgement and execution and sale."†

*Sections six and seven were enacted in 1887, Pamphlet Laws, page 181.

†Act of June 3, 1887, Pamphlet Laws, 1887, page 337, amending act of April 9, 1872, Pamphlet Laws, 1872, page 47.

LIENS ON VESSELS, DECEDENTS' ESTATES AND STOCKHOLDERS FOR WAGES.

1. I. Lien for wages and services on vessels navigating the Allegheny, Monongahela and Ohio rivers.
II. Lien for materials and labor.
III. Lien for bills, notes, etc., given for wages, materials or labor.
IV. Lien for wharfage or anchorage.
V. Lien for damages.
2. Priority of these claims.
3. Lien for wages is limited for three months.
4. Lien on decedents' estates.
5. Lien on stockholders of corporations.

"The stockholders of any and all corporations, under this act, shall be personally liable for all sums of money due to laborers, clerks and operatives, for services rendered within six months before demand made upon the corporation, and its neglect or refusal to make payment; and when judgment is obtained against any corporation for wages or labor due to an amount not exceeding two hundred dollars, said corporation shall not be entitled to stay of execution."*

1. "All ships, steamboats or vessels navigating the rivers Allegheny, Monongahela or Ohio, in this state, shall be liable and subject to a lien in the following cases:

I. For all the wages due to hands or persons employed, whether as master, clerk or otherwise, on board such ships, steam or other boats or vessels, for work and labor done, or for services rendered on board or for the same.

II. For all debts contracted by the owner or owners, agent, consignee, master, clerk or clerks of such ships, steam or other boats, or vessels of whatever kind, character or description, for and on account of work and labor done, or materials furnished, by boat-builders, engine-builders, boiler-makers, lumbermen, boat, store and provision furnishers, carpenters, blacksmiths, mastmakers, blockmakers, ropemakers, sailmakers, chairmakers, furniture-makers and venders, riggers, joiners, carvers, plumbers, painters, upholsterers, ship-chandlers, coppersmiths, brass-founders, coopers and venders of sail-cloth and canvas, in the building, repairing, fitting, furnishing or equipping such ships, steam or other boats or vessels of whatsoever kind, character or description, as hereinbefore specified and enumerated.

III. For all bills, bonds, notes, bills of exchange, or all or any other acknowledgment or obligation of indebtedness for and on account, of such ships, steam or other boats or vessels as hereinbefore specified and

* Purdon's Dig. 1144, § 11.

enumerated, signed and given, or purporting to be signed and given, in the name or for or on account of such ships steam or other boats or vessels, and owned by any owner or owners, agent, consignee, master, clerk or clerks of the same, to any of the classes above enumerated, whether the same be signed and given on account of work or labor done, or materials furnished, in the building, repairing, fitting, furnishing, equipping or insuring such ships, steam or other boats or vessels as hereinbefore specified or enumerated: *Provided*, That the lien of the same shall continue in favor and to the benefit of all and every party or parties whomsoever, into whose hands the same may have passed by transfer, assignment or otherwise.

IV. For all sums due for wharfage or anchorage of any such ships, steam or other boats or vessels of whatsoever kind, character or description, as hereinbefore specified and enumerated.

V. For all demands or damages accruing from the non-performance or mal-performance of any contract of affreightment, or of any other contract entered into by the owner or owners, agent, consignee, clerk or clerks of any such ships, steam or other boats or vessels, as hereinbefore specified and enumerated, touching the transportation of person or property, or for all damages or for injuries done to the same, in any way or manner, by such ships, steam or other boats or vessels as hereinbefore specified and enumerated.”*

2. “These classes of claims shall have priority according to the order in which they are above specified and enumerated, and the liens under this act shall have precedence of all other liens and claims against any such ships, steam or other boats or vessels, as hereinbefore specified and enumerated, and owing by the owner or owners thereof, in relation thereto or on account of the same: *Provided*, No precedence or priority of claim or lien shall exist or obtain, between any of the parties enumerated and specified in the second class, other than as the same shall exist and obtain by operation of law.”†

3. “No more than three months’ wages shall be recovered in any suit upon a lien in the first class above specified and enumerated; and every person claiming a lien in that class shall commence his suit within sixty days after three months’ wages shall have become due and owing as aforesaid; and in case there shall not be three months’ wages due and owing, or if the contract for service shall have terminated in a shorter time than three months as aforesaid, then the same shall be commenced within sixty days after the same is due and owing, and within sixty days after the conclusion and termination of such contract.”‡

4. The application of this statute has been before the courts on several occasions, but no questions have been involved specially affecting the rights of working classes.

* Purdon’s Dig. 126, § 20.

† Purdon’s Dig., 127, § 21.

‡ Purdon’s Dig. 127, § 22.

4. "All debts owing by any person within this state, at the time of his decease, shall be paid by his executors or administrators, so far as they have assets, in the manner and order following, viz: 1. Funeral expenses, medicine furnished and medical attendance given during the last illness of the decedent, and servants' wages, not exceeding one year; 2. Rents, not exceeding one year; 3. All other debts, without regard to the quality of the same; except debts due to the commonwealth, which shall be last paid."*

5. The stockholders of any and all corporations under this act, shall be personally liable for all sums of money due to laborers and operators, for services rendered within six months before demand made upon the corporation, and its neglect or refusal to make payment.†

APPROPRIATION OF WAGES TO CHARITABLE PURPOSES.

"It shall be due of any corporation, manufacturing establishment or colliery, to retain from and out of the wages or earnings of any person by them employed, on his written order, any contribution or voluntary subscription by such person, made in monthly or other payments, for the support of any hospital or other charitable institution, and the sum so retained to pay over upon demand to such hospital or other charitable institution; and any payment so made shall be as valid as if paid to the person by whom said wages or earnings were earned: *Provided*, That the hospital or charitable institution claiming the same, shall give notice in writing, at least ten days before the time for the payment, of said wages or earnings to such corporation, manufacturing establishment or colliery, of the name or names of the person or persons by them employed who have subscribed to the support of such hospital or charitable institution, and the amount by them severally subscribed, and when or how often payable, and how long to continue, and file said subscription with said corporation, manufacturing establishment or colliery."‡

* Act of Feb. 24, 1834, Pamp. Laws, 1834, 77, Purdon's Dig. 525.

† Purdon's Dig. 1646, § 7.

‡ Purdon's Dig. 253, § 35.

LABORERS.*

1. Eight hours are to be a day's labor.
2. The act does not apply to agriculture labor, or services by the year, month or week.
3. Priority of wages of laborers engaged in lumbering.
4. Notice of claim.
5. Determination of disputes.
6. When owners may pay claims and charge the amount to contractors.
7. How employes at mines and manufactories are to be paid.
8. They are to be paid in money or cash orders.
9. Only cash orders can be issued. Penalty for violating this law.
10. Limitation of rate of profit of employers on sales to employes.
11. Interest on orders on failure to obtain immediate payment.
12. Labor holiday.

1. Eight hours of labor, between the rising and the setting of the sun, shall be deemed and held to be a legal day's work, in all cases of labor and service by the day, where there is no contract or agreement to the contrary.

2. This act shall not apply to or in any way affect farm or agricultural labor or service by the year, month or week; nor shall any person be prevented, by anything herein contained, from working as many hours over time or extra work, as he or she may see fit; the compensation to be agreed upon between the employer and employe.

3. All moneys that may be due from any person or persons to any and every laborer, for work done in and about the cutting, peeling, skidding, hauling and driving of saw-logs, for a period not exceeding six months prior to the death or assignment for the benefit of creditors of the employer or employers, shall be preferred and first paid out of the proceeds of any executor's, administrator's, assignee's, sheriff's or other officer's sale of said saw-logs, as the property of the employer or employers: *Provided*, That not more than two hundred dollars to any one laborer shall be preferred under this act.

4. It shall be the duty of every laborer, claiming a preference under this act, by himself, his agent or attorney, to give notice in writing of the amount of his claim, before the sale, to the executors, administrators, assignee, sheriff or other officer whose duty it shall be to sell said saw-logs, otherwise his claim shall not be preferred under this act.

5. When there shall be any dispute concerning the right of any laborer to be preferred as aforesaid, or as to the amount he shall be entitled to receive, the court having jurisdiction of the accounts of the officer making the sale, or of the process under which the sale is made,

* Purdon's Dig. 1009.

shall have power, after reasonable notice given, either personally or by advertisement, to hear and determine the same according to law and equity.

6. When work, as aforesaid, shall have been done for a contractor or contractors and not for the owner or owners of saw-logs, it shall be lawful for the owner or owners to make payment of any moneys due to any laborer or laborers for such work, directly to such laborer or laborers; and any payment or payments so made, shall be a good charge against the contractor or contractors in favor of the owner or owners, in the settlement of their accounts.

7. All persons, firms, companies, corporations or associations in this commonwealth, engaged in mining coal, ore or other mineral, or mining and manufacturing them, or either of them, or manufacturing iron or steel, or both, or any other kind of manufacturing, shall pay their employes as provided in this act.

8. All persons, firms, companies, corporations or associations, engaged in the business aforesaid, shall settle with their employes at least once in each month, and pay them the amounts due them for their work or services in lawful money of the United States or by the cash order as described and required in section three of this act: *Provided*, That nothing herein contained shall affect the right of an employe to assign the whole or any part of his claim against his employer.

9. It shall not be lawful for any person, firm, company, corporation or association, their clerk, agent, officer or servant, in this state, to issue for payment of labor, any order or other paper whatsoever, unless the same purports to be redeemable for its face value in lawful money of the United States, bearing interest at legal rate, made payable to the employe or bearer, and redeemable within a period of thirty days, by the person, firm, company, corporation or association giving, making or issuing the same; and any person, firm, company, corporation or association engaged in the business aforesaid, their clerk, agent, officer or servant, who shall issue for payment of labor any paper or order, other than the one herein specified, in violation of this section, shall be guilty of a misdemeanor, and upon conviction shall be fined in any sum not exceeding \$100.00, in the discretion of the court, which shall go to the common school fund of the district wherein the crime shall have been committed.

10. It shall be unlawful for any person, firm, company, corporation or association engaged in mining or manufacturing, either or both, as aforesaid, and who shall likewise be either engaged, or interested, directly or indirectly, in merchandising, as owner or otherwise, in any money, per cent., profit or condition arising from the sale of such merchandise, their clerks, servants, officers or agents, to knowingly and wilfully sell or cause to be sold to any employe, any goods, merchandise or supplies whatever, for a greater per cent. of profit than merchandise and supplies

of like character, kind, quality and quantity are sold to other customers buying for cash and not employed by them; and shall any person or member of any firm, company, corporation or association, his or their clerks, agent or servant, violate this section of this act, then and in that case, the debt for goods so sold shall not be collectable against the employe so purchasing.

11. If any person, firm, company, corporation or association shall refuse, for the space of twenty days, to settle and pay any of their said employes at the intervals of time as provided in section two of this act, or shall neglect or refuse to redeem any of (the) cash orders herein provided for, within the time specified, if presented and suit should be brought for the amount overdue and unpaid, judgment for the amount of said claim proven to be due and unpaid, with a penalty of one per centum of such amount added thereto, for each and every month's delay, shall be rendered in favor of the plaintiff in such action: *Provided further*, That the cash order, herein provided for, given for the payment of labor, if the laborer continues to hold the same, in case of the insolvency of the company or person or firm or corporation giving the same, such laborer shall not lose his lien and preference under existing law.

12. The first Monday of September in each year, after the passage of this act, shall be a holiday to be known as "Labor Holiday."*

*Purdon's Dig. 2521.

PAYMENT OF LABORERS ENGAGED IN STOCKING SAWLOGS.*

1. Wages of laborers are to have priority.
2. Notice of claims are to be given before sales.
3. Court is to hear and determine disputes.
4. When owners may pay claims and charge the amounts paid to contractors.

1. "All moneys that may be due from any person or persons to any and every laborer, for work done in and about the cutting, peeling, skidding, hauling and driving of saw-logs, the hewing, making, skidding and hauling of square timber, and the peeling, skidding and hauling of bark for a period not exceeding six months prior to the death or assignment for the benefit of creditors of the employer or employers, or to a sale of said saw-logs, square timber or bark upon execution process against said employer or employers, shall be preferred and first paid out of the proceeds of any executor's, administrator's, assignee's, sheriff's or other officer's sale of saw-logs, square timber or bark as the property of the employer or employers: *Provided*, That when work as aforesaid shall have been done for a contractor or contractors, and not for owners of said saw-logs, square timber or bark, all moneys due as aforesaid shall be preferred and paid to laborers as aforesaid, and any payment or payments so made, shall be a good charge against the contractor or contractors in favor of the owner or owners in settlement of their account: *And provided further*, That not more than two hundred dollars to any one laborer shall be preferred under this act."†

2. It shall be the duty of every laborer claiming a preference under this act, by himself, his agent or attorney, to give notice in writing of the amount of his claim, before the sale, to the executors, administrators, assignee, sheriff, or other officer, whose duty it shall be to sell said saw-logs; otherwise his claim shall not be preferred under this act.

3. When there shall be any dispute concerning the right of any laborer to be preferred as aforesaid, or as to the amount he shall be entitled to receive, the court having jurisdiction of the accounts of the officers making the sale, or of the process under which the sale is made, shall have power, after reasonable notice, given either personally or by advertisement, to hear and determine the same according to law and equity.

4. When work as aforesaid shall have been done for a contractor or contractors, and not for the owner or owners of saw-logs, it shall be lawful for the owner or owners to make payment of any moneys due to any laborer or laborers for such work, directly to such laborer or laborers, and any payment or payments so made, shall be a good charge against the contractor or contractors in favor of the owner or owners in the settlement of their accounts.

*The last four sections were enacted in 1879. Pamp. Laws, 1879, page 176.

† Act of May 7, 1891, Pamp. Laws, 1891, page 44.

RAILROAD EMPLOYEES.*

1. Abandonment of locomotives by engineers.
2. Refusal to aid in the movement of cars.
3. Interfering with employes of railroad company.
4. Obstructing tracks and injuring railroad property.
5. A day's work for railroad employes.

1. If any locomotive engineer, or other railroad employe, upon any railroad within this state, engaged in any strike, or with a view to incite others to such strike, or in furtherance of any combination or preconcerted arrangement with any other person to bring about a strike, shall abandon the locomotive engine in his charge, when attached either to a passenger or freight train, at any place other than the schedule or otherwise appointed destination of the train, or shall refuse or neglect to continue to discharge his duty, or to proceed with said train to the place of destination as aforesaid, he shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined not less than one hundred dollars or more than five hundred dollars, and may be imprisoned for a term not exceeding six months, at the discretion of the court.

2. If any locomotive engineer, or other railroad employe, within this state, for the purpose of furthering the object of, or lending aid to any strike or strikes, organized or attempted to be maintained on any other railroad, either within or without this state, shall refuse or neglect, in the course of his employment, to aid in the movement over and upon the tracks of the company employing him, (or) the cars of such other railroad company, received therefrom in the course of transit, he shall be deemed guilty of a misdemeanor; and upon conviction thereof, shall be fined not less than one hundred dollars nor more than five hundred dollars, and may be imprisoned for a term not exceeding six months, at the discretion of the court.

3. If any person, in aid or furtherance of the objects of any strike upon any railroad, shall interfere with, molest or obstruct any locomotive engineer, or other railroad employe, engaged in the discharge and performance of his duty as such, every person so offending shall be deemed guilty of a misdemeanor; and upon conviction thereof, shall be fined not less than one hundred nor more than two hundred dollars, and may be imprisoned for a term not exceeding six months, at the discretion of the court.

4. If any person or persons, in aid or furtherance of the objects of any strike, shall obstruct any railroad track within the state, or shall in-

* Act of March 22, 1877, Pamph. Laws 1877, page 14, Purdon's Digest page 426.

jure or destroy the rolling-stock or any other property of any railroad company, or shall take possession of, or remove any such property, or shall prevent or attempt or prevent the use thereof by such railroad company or its employes, every such person so offending shall be guilty of a misdemeanor; and upon conviction thereof, shall be fined not less than five hundred dollars nor more than one thousand dollars, and may be imprisoned not less than six months nor more than one year, at the discretion of the court.

5. In 1887 the legislature enacted "that from and after the passage of this act it shall be unlawful for the president, board of directors, superintendent, or other agents of any horse, cable and electric railway company to permit or suffer any conductor, driver, or any other person in the employ of any such company, to work more than twelve hours in any one day in the service of such company: *Provided*, That all necessary labor, over and above the time set by this section, shall be considered overwork, for which the laborer shall receive additional compensation."*

* Act of March 24, 1887, Pamphlet Laws, 1887, page 13 ; Purdon's Digest, 2379, § 10.

CONVICT LABOR.*

1. Convicts to be employed in behalf of the state.
2. And inmates of reformatory institutions.
3. Convicts in county prisons.
4. Convicts to receive wages for labor.
5. Convict made goods to be so branded.
6. Eight hours a day's labor in penitentiaries.
7. More than eight hours' services prohibited.
8. Governor to carry out the act.
9. Repealing clause.

1. At the expiration of existing contracts, the board of inspectors, wardens, or other officers of state prisons and reformatory institutions are directed to employ the convicts under their control for and in behalf of the state.

2. The chief officers of the various reformatory institutions, deriving their support wholly or in part from the state, are hereby directed, at the expiration of existing contracts, to employ the inmates of said institutions for and in behalf of such institutions; and no labor shall be hired out by contract.

3. The officers of the various county prisons, workhouses and reformatory institutions within this commonwealth, now letting the labor of convicts by contract, shall, at the expiration of existing contracts, employ the same for and in behalf of their respective counties.

4. All convicts under control of the state and county officers, and all inmates of reformatory institutions engaged in manufacturing articles for general consumption, shall receive quarterly wages equal to the amount of their earnings, to be fixed from time to time, by the authorities of the institution, from which board, lodging and clothing, and the costs of trial, shall be deducted, and the balance paid to their families or dependents. In case none such appear the amount shall be paid to the convict at the expiration of the term of imprisonment.

5. All goods, wares, merchandise or other article or thing made by convict labor, in any penitentiary reformatory prison, school or other establishment in which convict labor is employed, whether for the direct benefit and maintenance of such penitentiary, reformatory prison, school or other establishment, or upon contract by the authorities of the same with any third person, all and every such goods, wares, merchandise, article or thing, immediately upon completion of the same, shall be branded as hereinafter provided, and shall not be taken into or exposed in any place for sale, at wholesale or retail without such brand.

6. From and after the passage of this act, eight hours out of the twenty four of each day shall make and constitute a day's labor and service in

*Purdon's Dig. 1314, § § 13, 14, 15, 16, 17.

the penitentiary and reformatory institutions which shall receive support from appropriation made by the general assembly of this commonwealth, and by taxes levied and paid by the several counties thereof in whole or in part.*

7. All superintendents and officers over, and all persons authorized to make contracts for and to employ persons for labor and service, or appoint under-officers in, for and around said penitentiaries and reformatory institutions mentioned in the first section of this act, are hereby forbidden and prohibited, under penalties mentioned in the third section of this act, from allowing or compelling any said employes or under-officers to give and serve any more than eight hours out of each twenty-four hours in such service or labor.†

8. The Governor of this Commonwealth is hereby authorized and directed to execute and carry out the foregoing sections of this act, and is hereby authorized, empowered and directed, upon complaint and petition of any of the laborers, employes and under-officers, mentioned in the foregoing sections, that he or they have been compelled or required to serve contrary to the provisions of same foregoing sections of this act, to hear and determine the same, and in the event of it appearing to him that the provisions of this act have been violated or evaded, he is authorized and empowered to suspend or dismiss from his office or post the officer, superintendent or other person determined to be guilty of violating or evading the same, and that such vacancy caused by the suspension or dismissal of said officers, superintendents or other person so determined to have violated the provisions of this act, shall be filled in the manner heretofore provided by law.‡

9. All acts or parts of acts inconsistent herewith be and the same are hereby repealed: *Provided*, That this act shall not be construed to have reference to any institution wherein the employes are resident.§

* Act of May 20, 1891, Pamphlet Laws, 1891, page 100.

† Ibid.

‡ Ibid.

§ Ibid.

FACTORIES*

1. Ten hours to be a legal day's labor in factories.
2. Penalty for employing children under thirteen years.
3. Children between thirteen and sixteen, not to be employed more than nine months in a year; nor unless they have attended school three months in the year.
4. Penalty on parents, etc., for permitting children under thirteen years to be employed, or children between thirteen and sixteen, for more than ten hours in a day.
5. Time that minors may be employed.
6. Penalty for violation. How recoverable. Limitation.
7. Duties of constables.
8. Infants.

1. "Labor performed during a period of ten hours, on any secular day, in any cotton, woolen, silk, paper, bagging and flax factories, shall be considered a legal day's labor; and hereafter no minor shall be employed in and about any of said factories until he or she shall have obtained (attained) to the age of thirteen years.

2. "If any owner or employer of or in any of the said factories, or his, her or their agent, shall wilfully or knowingly employ any minor below the age of thirteen years as aforesaid, the person or persons so offending shall pay a penalty of fifty dollars for every such offense, to be sued for and recovered by any person suing for the same, as other debts of like amount are now recoverable, one-half of the same to belong to the person suing for the same, and the other half to the county in which the offense is committed.

3. "No minor who has attained the age of thirteen, and is under the age of sixteen years, shall be employed in any of the factories aforesaid for a longer period than nine calendar months in any one year, and who shall not have attended school for at least consecutive months within the same year; and any owner or employer of or in any of the factories aforesaid, offending against the provisions of this section shall be liable to the penalty provided in the third section of this act, to be sued for, recovered and applied as therein provided.

4. "If any parent or guardian shall consent to, permit or connive at, the employment of his or her child or ward, under the age of thirteen years, in any of the said factories; or if such parent or guardian shall consent to, permit or connive at, the employment of his or her child or ward, over the age of thirteen years, and under the age of sixteen years, for a longer period than ten hours in any secular day, the person so offending shall forfeit and pay the sum of fifty dollars for every such offense, to be sued for and recovered as provided in the third section of this act, and for the uses therein specified.

*Purdon's Dig. 771, acts of 1849 and 1855

5. "No male or female operative under the age of twenty-one years shall, under any contract, be employed in cotton, woolen, silk, flax, bagging or paper manufactories in this commonwealth, for a longer period than sixty hours in any one week, or more than an average of ten hours a day during the same period.

6. "If any person shall knowingly employ, or any parent or guardian consent to the employment, of any male or female operative, under the age of twenty-one years as aforesaid, contrary to the preceding section, and proof be made thereof before any alderman or justice of the peace of the ward, borough or district where such offence is committed, he, she or they so employing such operatives, or consenting thereto as aforesaid, shall, for every such offense, forfeit and pay the penalty of not less than ten nor more than fifty dollars, to be recovered before any alderman or justice of the peace of the proper ward, borough or district, in the same manner as the like penalties are now recovered, to be applied to the use of the public schools of the proper district: *Provided*, That no penalty shall be recovered under this act, unless sued for within one month after the same shall have occurred; nor shall any person recover more than one penalty for the working of any factory for the same period of time.

7. "All the ward, borough and township constables are hereby authorized and required, and it is hereby made their duty, to attend to the strict observance of the two preceding sections of this act, when complaint shall have been properly made to them of a violation of the same.

8. "It shall be unlawful for any person, persons, firms, companies, associations or corporations, to employ any child under the age of twelve years to do any work in or about any mill, manufactory or mine in this commonwealth.

"Any person, persons or corporations, who may violate this act, shall, on conviction, pay a fine of not less than twenty dollars, nor more than one hundred dollars, at the discretion of the court. Said fines, arising from the violation of this act, shall be paid to the treasury of the proper county where said violation shall occur." *

* Act of May 19, 1887, Purdon's Digest, 2218, §§ 6, 7.

FACTORY LEGISLATION OF 1889.

1. Employment of minors.
2. Children under twelve years of age are not to be employed.
3. Notice of hours of employment are to be posted.
4. What shall be deemed a factory.
5. Factory inspector.
6. Expenses.
7. Well holes to be secured and trap-doors to be applied.
8. Automatic shifters to be used. Cleaning machinery and motion ; safeguards.
9. Inspector to report accidents.
10. Separate wash rooms.
11. Forty-five minutes for meals.
12. Changes and safeguards to be made within sixty days after notice.
13. Deputy inspectors.
14. Expenses of deputies.
15. State may be districted. Removal of deputies.
16. Inspector's office. Administration oaths.
17. Violation of the act a misdemeanor.
18. Copy of the act to be posted in each work room.
19. Payment of salary and expenses of factory inspectors.

1. That no minor shall be employed at labor in factories or any manufacturing establishment or mercantile industry in this state, for a longer period than sixty hours in any week, unless for the purpose of making necessary repairs.

2. No child under twelve years of age shall be employed in any factory, manufacturing or mercantile establishment within this state. It shall be the duty of every person so employing children to keep a register, in which shall be recorded the name, birthplace, age and place of residence of every person so employed by him under the age of sixteen years. And it shall be unlawful for any factory, manufacturing or mercantile establishment to hire or employ any child under the age of sixteen years, without there is first provided and placed on file an affidavit, made by the parent or guardian, stating the age, date and place of birth of said child. If said child have no parent or guardian then such affidavit shall be made by the child, which affidavit shall be kept on file by the employer, and which said register and affidavit shall be produced for inspection on demand by the inspector or any of the deputies appointed under this act.

3. Every person, firm or corporation employing women and children or either in any factory, manufacturing or mercantile establishment, shall post and keep posted in a conspicuous place in every room where such help is employed, a printed notice stating the number of hours per day for each day of the week required of such persons, and in every

* May 20, 1889, Pamp. Laws 1889, page 243.

room where children under sixteen years of age are employed, a list of their names with their age.

4. No person, firm or corporation employing less than ten persons who are women or children shall be deemed a factory, manufacturing or mercantile establishment within the meaning of this act.

5. The Governor shall, immediately after the passage of this act, appoint, with the advice and consent of the Senate, a factory inspector at a salary of fifteen hundred dollars per year, whose term shall be three years. The said inspector shall be empowered to visit and inspect, at all reasonable hours, and as often as practicable, the factories, workshops, and other establishments in the state employing women or children, where the manufacture of goods is carried on, and to report to the Bureau of Labor Statistics of this state, on or before the thirtieth day of November of each year, the name of the factory, the number of such hands employed and the number of hours work performed each week. It shall also be the duties of said inspector to enforce the provisions of this act and to prosecute all violations of the same before any magistrate or any court of competent jurisdiction in the state.

6. All necessary expenses incurred by said inspector in the discharge of this duty shall be paid from the funds of the state, upon the presentation of proper vouchers for the same: *Provided*, That not more than twenty-five hundred dollars shall be expended by him therefor in any one year.

7. It shall be the duty of the owner, agent or lessee of any such factory, manufacturing or mercantile establishment, where hoisting-shafts or well-holes are used, to cause the same to be properly and substantially enclosed or secured, if in the opinion of the inspector it is necessary to protect the life or limbs of those employed in such establishments. It shall be the duty of the owners, agent or lessee to provide or cause to be provided such proper trap or automatic doors, so fastened in or at all elevator ways as to form a substantial surface when closed, and so constructed as to open and close by action of the elevator in its passage either ascending or descending.

8. It shall also be the duty of the owner of such factory, mercantile industry or manufacturing establishment, or his agent, superintendent or other person in charge of the same, to furnish and supply or cause to be furnished and supplied, in the discretion of the inspector, where dangerous machinery is in use, automatic shifters or other machinery contrivance for the purpose of throwing on or off belts or pulleys. And no minor under sixteen years of age shall be allowed to clean machinery while in motion. All gearing and belting shall be provided with proper safeguard.

9. It shall be the duty of the owner or superintendent to report, in writing, to the factory inspector all fatal accidents or serious injury done to any person employed in such factory, within forty-eight hours, stating as full as possible the cause of such injury.

10. A suitable and proper wash room and water closets shall be provided for females where employed, and the water closets used by females shall be separate and apart from those used by males, and shall be properly screened and ventilated and at all times kept in a clean condition.

11. Not less than forty-five minutes shall be allowed for the noon-day meal in any manufacturing establishment in this state. The factory inspector, his assistant or any of his deputies shall have power to issue permits in special cases, allowing a shorter meal time at noon, and such permit must be conspicuously posted in the main entrance of the establishment, and such permit may be revoked at any time the inspector deems necessary and shall only be given where good cause can be shown.

12. That if the inspector of factories find that the heating, lighting, ventilation or sanitary arrangement of any shop or factory is such as to be injurious to the health of persons employed therein, or that the means of egress in case of fire or other disaster is not sufficient or in accordance with all the requirements of law, or that the belting, shafting, gearing, elevators, drums and machinery in shops and factories are located so as to be dangerous to employes and not sufficiently guarded, or that the vats, pans or structures filled with molten metal or hot liquid are not surrounded with proper safeguards for preventing accident or injury to those employed at or near them, he shall notify the proprietor of such factory or workshop to make the alterations or additions necessary within sixty days, and if such alterations or additions are not made within sixty days from the date of such notice, or within such time as said alterations can be made with proper diligence upon the part of said proprietors, said proprietors or agents shall be deemed guilty of violating the provisions of this act.

13. The factory inspector now or hereafter appointed under and by virtue of the provisions of this law, is hereby authorized to appoint such number of persons as in his judgment may be necessary, not exceeding six, one-half of whom shall be females, who shall be known as deputy factory inspectors, either or any one of whom may be appointed to act as clerk in the main office, and whose duties it shall be to enforce the provisions of this act and of the several acts relating to factories and manufacturing establishments. The powers of said deputies shall be the same as the powers of the factory inspector, subject to the supervision and direction of the factory inspector.

14. The traveling expenses of each of said deputies shall be approved by the inspector and audited by the Auditor General of the state before payment, and said deputy inspectors shall have an annual salary of one thousand dollars, to be paid monthly by the treasurer of the state out of any moneys not otherwise appropriated.

15. Said factory inspector shall have power to divide the state into districts and to assign one of said deputies to each district, and may transfer any of the deputies to other districts in case the best interests.

of the state require it. The inspector shall have the power of removing any of the deputy inspectors at any time.

16. An office shall be furnished in the capitol as soon as practicable, which shall be set apart for the use of the factory inspector. The factory inspector and his deputies shall have the same power to administer oaths or affirmations as is now given to notaries public, in cases where persons desire to verify documents connected with the proper enforcement of this act.

17. Any person who violates any of the provisions of this act, or who suffers or permits any child or females to be employed in violation of its provisions, shall be deemed guilty of a misdemeanor and on conviction shall be punished by a fine of not more than five hundred dollars.

18. A printed copy of this act shall be posted by the inspector in each work-room of every factory, manufacturing or mercantile house where persons are employed who are effected by the provisions of this act.

19. WHEREAS, By the provisions of the act of May twentieth, one thousand eight hundred and eighty-nine (pamphlet laws, page two hundred and forty-three), provision was made for the appointment of a factory inspector and six deputies, and their compensation and duties were therein fixed and defined;

And whereas, The general appropriation act of Anno Domini one thousand eight hundred and eighty-nine, made no provision for the payment of the salary and expenses of the inspector or the expenses of his deputies; therefore,

1. *Be it enacted, etc.,* That the sum of nine thousand eight hundred and seventy-five dollars, or so much thereof as may be necessary, be and the same is hereby appropriated out of any money in the treasury not otherwise appropriated, to be paid on warrant drawn by the Auditor General in the usual manner, upon the presentation of duly authenticated vouchers, for the purpose of paying the salary and expenses of the factory inspector and the expenses of the deputy factory inspectors under the provisions of the act approved May twentieth, one thousand eight hundred and eighty-nine, creating the factory inspector's department. That the gross sum of money so appropriated be applied as follows: Two thousand three hundred and seventy-five dollars for the payment of the salary of the inspector from the first day of November, one thousand eight hundred and eighty-nine, to the thirty-first day of May, one thousand eight hundred and ninety-one; five thousand dollars, or so much thereof as may be necessary, for the payment of the expenses of said deputy factory inspectors from the time of their appointment to the thirty-first day of May, one thousand eight hundred and ninety-one; two thousand five hundred dollars, or so much thereof as may be necessary, for the payment of the contingent expenses of the inspector from the date of his appointment to the thirty-first day of May, one thousand eight hundred and ninety-one.*

* Act of Feb. 24, 1891, Pamp. Laws 1891, page 1.

FEMALES. *

1. Seats must be provided for them.
2. Punishment for violating the law.
3. Employment in coal mines prohibited. Office work excepted.

1. Every person, firm, association, individual, partnership or corporation employing female employes in any manufacturing, mechanical or mercantile establishment in this state, shall provide suitable seats for the use of the female employes so employed, and shall permit the use of such by them when they are not necessarily engaged in the active duties for which they are employed.

2. Any person, firm, association, individual, partnership or corporation, violating any of the provisions of this act, shall, upon conviction thereof before any magistrate, alderman or justice of the piece, be sentenced to pay a fine of not less than twenty-five nor more than fifty dollars, to be paid into the treasury of the proper county, and costs for each offence, and any failure to pay the same, shall be committed to the proper jail until discharged according to law.

3. It shall be unlawful for any person, firm, company, corporation or association engaged in mining coal, mining and manufacturing or manufacturing it, in this state, their clerks, agents, superintendents, officers or servants, to employ, cause or permit to be employed, any female laborer or laborers in and about the coal mine, or any of the manufactories of coal, in this state; and any person so offending, upon conviction, shall be fined in any sum not exceeding five hundred dollars, nor less than one hundred dollars, or be imprisoned in the county jail for a period not exceeding six months, either or both in the discretion of the court: one-half of said fine to go to the informer and the remainder to the school fund of the district wherein the offence shall have been committed: *Provided, however,* That the provisions of this bill shall not affect the employment of a female in an office or in the performance of clerical work at such mine or colliery.

* Purdon's Dig. 2206.

COURTS OF CONCILIATION.

1. License for establishing the tribunal.
2. Form of petition and testimony to support the same.
3. Qualifications of petitioners.
4. When the license may be issued.
5. When the tribunal may be licensed conditionally.
6. One tribunal may be created for each trade, their period of continuance and awards.
7. Composition of the tribunal and how organized.
8. Compensation and expenses.
9. Power of the chairman, of umpires, decisions of questions of evidence, appointment of committees to examine questions, and rules of practice.
10. Questions in dispute to be defined in writing, time for filing the award and judgment on the same.
11. How the act shall be cited.
12. Form of petition for creating the tribunal.
13. Form of license.
14. Form of submission and of award.

1. "Whereas, differences arise between persons engaged in the iron, steel, glass textile, fabrics and coal trades in this state, and strikes and lock-outs result therefrom, which paralyze these important industries, bring great loss upon both employer and employed, and seem to find their only solution in starvation or in force, which does not accord with the teachings of humanity and the true policy of our laws: And whereas, voluntary tribunals, mutually chosen, with equality of representation and of rights, and a frank discussion therein by the persons interested, of the business questions involved, are the plain paths to mutual concession and cessation of strife, and the choice of an umpire by the parties themselves, to whose arbitrament the matters in dispute are to be submitted for final decision, if they shall fail to agree, is in accord with the practice and policy of this commonwealth: Therefore, the presiding judges of the courts of common pleas, or the president judges thereof, in chambers, in the counties of Philadelphia and Allegheny, and of each of the other judicial districts of this commonwealth, shall have power, and upon the presentation of the petition, or of the agreement hereinafter named, it shall be the duty of each of them, to issue, in the form hereinafter named, a license or authority for the establishment, within their respective districts, of tribunals for the consideration and settlement of disputes between employers and employed, in the iron, steel, glass, textile fabrics and coal trades, and each of them."*

2. "The said petition or agreement shall be substantially in the form hereinafter given, and the petition shall be signed by at least fifty persons employed as workmen, by five or more separate firms, individuals,

*Purdon's Dig., page 114, § 67.

or corporations within the county where the petitioners reside, or by at least five employers, each of whom shall employ at least ten workmen, or by the representatives of a firm, individual or corporation employing not less than seventy-five men in their business; and the agreement shall be signed by both of said specified numbers and persons: *Provided*, That if, at the time the petition is presented, a dispute exists between the employers and the workmen, and that as a consequence there is a suspension of work, or owing to the nature of the dispute, a suspension is probable, the judge before whom said petition is presented, shall require testimony to be taken as to the representative character of said petitioners, and if it appears that the said petitioners do not represent the will of a majority, or at least one-half of each party to the dispute, the license for the establishment of the said tribunal may be denied.”*

3. “The person signing said petition as workmen, shall each have been a resident of the judicial district in which the petition shall be presented, for at least one year, shall have been engaged in some branch of the trade they profess to represent, for at least two years, and be a citizen of the United States. The persons signing the same as employers, shall be citizens of the United States, and shall be, and shall have been, actually engaged in some branch of the iron, steel, glass, textile fabrics or coal trade, within the judicial district, for at least one year, and shall each employ therein at least ten workmen, of the class hereinbefore described, and may be a firm, individual or corporation; and said petition shall be verified by the oaths of at least two of the signers, attesting the truth of the facts stated therein, and the qualifications of the signers thereto.”†

4. “If the said petition shall be signed by the requisite number of both employers and workmen, and be in proper form and contain the names of the persons to compose the tribunal, being an equal number of each side, and of the umpire mutually chosen, the judge shall forthwith issue a license, substantially in the form hereinafter given, authorizing the existence of such tribunal and fixing the time and place of the first meeting thereof, which shall be made a record in the court of common pleas over which said judge presides.”‡

5. “If the petition shall be signed by the requisite number of either workmen or employers, and not by both, and be in proper form, the judge shall issue his license for the creation of such tribunal, conditioned upon the assent and agreement of the necessary number of that side to the issue, which shall not have signed the petition; which assent shall be in writing, signed by the requisite number, and contain the names of the members of the tribunal, and the umpire, and upon the presentation of such petition and assent, the judge shall issue his license for a tri-

*Purdon's Dig. page 114, § 63.

†Purdon's Dig. page 114, § 69.

‡Purdon's Dig. 115, § 70.

bunal, as provided in section four of this act; but if no such assent shall be obtained, within sixty days of the date of the conditional license, the petition shall be taken as dismissed, but if the assent be signed, a record shall be made of the license, as if made upon original agreement.”*

6. “One of the said tribunals may be created for each of the trades named in the first section of this act, in each judicial district; they shall continue in existence for one year from the date of the license creating them, and may take jurisdiction of any dispute between employers and workmen, who shall have petitioned for the tribunal, or have been represented in the petition therefor, or who may submit their disputes in writing to such tribunal for decision. Vacancies occurring in the membership of the tribunal, shall be filled by the judge, out of the three names presented to him by the members of the tribunal remaining of that class in which the vacancies occur. Removal to an adjoining district shall not cause a vacancy, in either the tribunal or the post of umpire. Disputes occurring in one county, may be referred to a tribunal already existing in an adjoining county. The place of umpire, in any of said tribunals and vacancies occurring in such place, shall only be filled by the mutual choice of the whole of the representatives, of both employers and workmen constituting the tribunal. The umpire shall only be called upon to act, after disagreement is manifested in the tribunal, by failure during three meetings held, and full discussion had. His award shall be final and conclusive upon such matters only as are submitted to him in writing and are signed by the whole of the members of the tribunal, or by parties submitting the same, and upon questions affecting the price of labor; it shall in no case be binding upon either employer or workmen, save as they may acquiesce or agree therein after such award.”†

7. “The said tribunal shall consist of not less than two employers, or their representatives, and two workmen. The exact number, which shall in each case constitute the tribunal, shall be inserted in the petition or agreement, and they shall be named in the license issued. The said tribunal, when convened, shall be organized by the selection of one of their number as chairman, and one as secretary, who shall be chosen by a majority of the members, or if such majority cannot be had, after two votes, then by secret ballot, or by lot, as they prefer.”‡

8. “The members of the tribunal shall receive no compensation for their services from the city or county, but the expenses of the tribunal, other than fuel, light and the use of the room and furniture, may be paid by voluntary subscription, which the tribunal is authorized to receive and expend for such purposes. Each city or county, in which such tribu-

* Purdon's Dig. 115, § 71.

† Purdon's Dig. 115, § 72.

‡ Purdon's Dig. 115, § 73.

nal shall be created, shall pay for the fuel, lights and the use or rent of a room and furniture for the same, which it is hereby authorized to obtain, but the cost of the same shall only be paid upon sworn vouchers, submitted to, and approved by, the proper judge of the judicial district.”*

9. “When no umpire is acting, the chairman shall have power to administer oaths, sign subpoenas, orders, notices and other proceedings of the board; and when the umpire shall be acting, this authority shall be vested in him, and all of the authority vested in boards of arbitrators, by the compulsory arbitration act of June 13th, 1836, for procuring witnesses, preserving order and obtaining proofs, shall be and is hereby vested in such umpire, when acting. Attorneys-at-law, or other agents of one side or the other, shall not be permitted to appear, or take part in any of the proceedings of the tribunal or before the umpire; but the same shall be as far as possible voluntary, and upon examination of proofs and witnesses by the tribunal itself and the umpire. When the umpire is acting, he shall preside; and his determination upon all questions of evidence, or otherwise, in conducting the inquiries then pending, shall be final. Committees of the tribunal, consisting of an equal number of each class, may be constituted to examine into any question in dispute, between employers and workmen, submitted to the tribunal, and such committee may hear and settle the same finally, when it can be done, by an unanimous vote; otherwise the same shall be reported to the full tribunal, and be there heard, as if the question had been originally examined by it. The said tribunals, in connection with the umpire, shall each have power to make, ordain and enforce rules for the government of the body when in session, to enable the business to be proceeded with in order, and to fix its sessions and adjournments; but such rules shall not conflict with this statute, nor with any of the provisions of the constitution and laws of Pennsylvania.”†

10. “Before the umpire shall proceed to act, the question or questions in dispute shall be plainly defined in writing, and signed by the members of the tribunal, or a majority thereof of each class, or by the parties submitting the same; and such writing shall contain the submission of the decision thereof to the umpire by name, and shall provide that his decision thereon, after hearing, shall be final. The umpire shall be sworn to impartially decide the question submitted. The submission and his award may be made in the form hereinafter given; and said umpire must make his award within ten days from the time the question or questions in dispute are submitted to him. When such award shall be made and signed by the umpire, it may be made a matter of record, by producing the same, within thirty days, with the submission in writing, to the proper judge. If he approves the same, he shall endorse his approval thereon, and direct the same to be entered of record. When so

* Purdon's Dig. 115, § 74.

† Purdon's Dig. 116, § 75.

entered of record, it shall be final and conclusive, and the proper court may, on motion of anyone interested, enter judgment thereon; and when the award is for a specific sum of money, may issue final and other process to enforce the same.”*

11. “This act shall be cited and quoted as the ‘voluntary trade tribunal act of 1883.’”†

“The form of the joint petition or agreement, praying for a tribunal, as named in section four of this act, may be as follows:

“*To the presiding judge, ——— judicial district, or to the presiding judge of the court of common pleas, the county of ——— (as the case may be).*

“The subscribers hereto, citizens of the said judicial district, and of the United States, being the number thereof and with the qualifications required by the act known as, ‘the voluntary trade tribunal act, of 1883,’ being desirous of establishing a tribunal under said act, for the settlement of disputes in the ——— trade, and having agreed upon A. B., et cetera, representing the employers, and C. D., et cetera, representing the workmen, as members of the said tribunal, who each possess the qualifications required by said act, and having also agreed upon E, F., ——— of ——— as the umpire of the said tribunal, pray that a license for a tribunal in the ——— trade may be issued to them; and they will ever pray, et cetera.

EMPLOYES.	Names.	Residence.	Works.	No. Employes.

EMPLOYES.	Names.	Residence.	By whom employed.

* Purdon’s Dig. 116, § 76.

† Purdon’s Dig. 116, § 77.

The oath to be annexed to such joint petition shall be substantially as follows:

PENNSYLVANIA, }
 ———— county. } ss :

A. B. and C. D., two of the signers to the foregoing joint petition, being duly sworn, say, that the facts set forth in the same are true; that the five employers, signing such petition, have been actually engaged in the ——— trade, within this judicial district, for at least one year, and each do now employ at least ten workmen in their said business; and the fifty workmen signing said petition have each been resident therein for one year, have been engaged in the ——— trade as workmen, for at least two years, and (have been or are) actually employed, at the places named in the signatures to said petition in such trade.

A. B.

C. D.

And the same shall be sworn and subscribed, before a justice of the peace or alderman of the proper district.*

The license to be issued upon such joint petition may be as follows:

PENNSYLVANIA, }
 ———— county, } ss :

——— Judicial district.

WHEREAS, The joint petition and agreement of five employers and fifty workmen has been to me presented, and now placed on record, praying the creation of a tribunal for the settlement of disputes in the ——— trade, within this district, and naming A. B., C. D., E. F. and G. H. as members of said tribunal, and I. J. as the umpire thereof: Now, in pursuance of the authority given by the voluntary trade tribunal act of 1883, I have licensed and authorized, and do hereby license and authorize, the said named parties, to be and exist as a tribunal under the said statute, for the settlement of disputes between employers and workmen in ——— trade, for the term of one year, with all the powers conferred by the voluntary trade tribunal act of 1883, and it shall meet and organize on the ——— day of ——— A. D. 188—, at ———. (A record hath been made of this license). Witness my hand, and the seal of the court, at ——— this ——— day of ——— A. D. 188).†

Presiding Judge.

14. The forms of the submission and of the awards may be as follows:

FORM OF SUBMISSION.

We, A. B., of one part, and C. D., of the other part, under the provisions of voluntary trade tribunal act of 1883, have submitted and referred, and

* Purdon's Dig. 116, §78.

† Purdon s Dig. 117 §19.

do hereby submit and refer, unto the umpirage and decision of E. F., the umpire of the trade tribunal of the———trade for the judicial district, the following subject-matter, that is to say (here state fully and distinctly the question submitted), and his decision and determination upon the same shall be binding upon us, and final and conclusive upon the question thus submitted; and we pledge ourselves to abide by, and carry out, the decision of the umpire when made. Witness our hands and seals, this———day of———Anno Domini one thousand eight hundred and eighty——.

(Signatures).

FORM OF AWARD.

I, E. F., the umpire of the———trade tribunal, of the judicial district, in pursuance of the foregoing instructions, having been sworn, and having heard the parties and their proofs bearing upon the question submitted for my decision and umpirage, have decided and do hereby decide as follows (here insert distinctly the decision): and do hereby certify to the president judge of the judicial district, that this is my award and determination of the subject-matter to me referred. Witness my hand and seal, at———this———day of———A. D. 188——.*

———, (L. S.)
Umpire.

* Purdon's Dig. 117, § 80.

ASSIGNMENTS.

1. An assignment by a railroad or canal company without the consent of the laborers.
2. Preferences except for wages are void.
3. Stipulation for a release is to be deemed a preference.
4. Wages to the extent of \$100 may be lawfully preferred.
5. The object of the first provision of this law.
6. Who are meant by laborers and workmen.
7. Household furniture not exceeding \$300 may be set aside for the assignor's family.

1. "It shall not be lawful for any company incorporated by the laws of this commonwealth, and empowered to construct, make and manage any railroad, canal or other public internal improvement, while the debts and liabilities, or any part thereof incurred by the said company to contractors, laborers and workmen employed in the construction or repairs or said improvement remain unpaid, to execute a general or partial assignment, conveyance, mortgage or other transfer of the real or personal estate of the said company, so as to defeat, postpone, endanger or delay their said creditors, without the written assent of the said creditors first had and obtained; and any such assignment, conveyance, mortgage or transfer shall be deemed fraudulent, null and void, as against any such contractors, laborers and workmen, creditors as aforesaid."*

"Whereas, it frequently happens that incorporated companies, by assignment, conveyance, mortgage or other transfer, divest themselves of their real and personal estate, in contravention of the provisions of the resolution of January 21st, 1843: Therefore, whenever any incorporated company, subject to the provisions of the above resolution, shall divest themselves of their real or personal estate, contrary to the provisions of the said resolution, it shall and may be lawful for any contractor, laborer or workman employed in the construction or repair of the improvements of the said company, having obtained judgment against the said company, to issue a *scire facias* upon said judgment, with notice to any person, or to any incorporated company, claiming to hold or own said real or personal estate, to be served in the same manner as a summons, upon the defendant, if it can be found in the county, and upon the person or persons, or incorporated company claiming to hold or own such real estate; and if the defendant cannot be found, then upon the return of one *nihil* and services aforesaid, on the person or persons, or company claiming to hold or own as aforesaid, the case to proceed as in other cases of *scire facias* on judgment against terre-tenants."†

*Purdon's Dig. 118, § 1.

† Purdon's Dig. 121, § 12.

2. "All assignments of property in trust which shall hereafter be made by debtors to trustees, on account of inability at the time of the assignments to pay their debts, to prefer one or more creditors (except for the benefit of wages of labor), shall be held and construed to inure to the benefit of all the creditors in proportion to their respective demands, and all such assignments shall be subject in all respects to the laws now in force relative to voluntary assignments: *Provided*, That the claims of laborers, thus preferred, shall not severally exceed the sum of fifty dollars."*

3. "Any condition in assignments of property, made by debtors to trustees on account of inability at the time of the assignment to pay their debts, within the meaning of the act entitled 'An act to prevent preferences in assignments,' approved April 17th, 1843, for the payment of the creditors only who shall execute a release, shall be taken as a preference in favor of such creditors and be void, and the assignment be held and construed to inure to the benefit of all the creditors in proportion to their respective demands."†

4. "In all assignments of property, whether real or personal, which shall hereafter be made by any person or persons or chartered company, to trustees or assignees, on account of inability, at the time of the assignment, to pay his or their debts, the wages of miners, mechanics and laborers employed by such person or persons or chartered company, shall be first preferred and paid by such trustees or assignees, before any other creditor or creditors of the assignor: *Provided*, That any one claim thus preferred shall not exceed (one hundred) dollars.'‡

5. The first of these sections is a joint resolution of the general assembly, passed January, 1843, and was intended, as its title implies, so Mr. Justice Paxon has remarked: "To protect laborers and contractors employed upon railroads, canals and other public works, and in order to give effect to such intent it declared that all assignments, conveyances, mortgages or other transfers of the property of such corporations should be null and void as against the claims of such persons. But by the very terms of the act its benefits are extended only to such laborers and contractors as have a contract relation with the company. Sub-contractors and laborers employed by sub-contractors, are not within its protection. The auditor (in the the case before the court) concedes this to be so, but held that the supplement of 4th of April, 1862,§ extended the protection of the resolution of 1843 to all contractors and laborers employed upon the work. It is true, the two acts must be treated in *pari materia*. But the plain object of the act of 1862, was to give a remedy to the persons named in the resolution of 1843 The

*Purdon's Dig. 118, § 2.

†Purdon's Dig. 119, § 3.

‡Purdon's Dig. 119, § 4.

§Pamphlet Laws 235.

mischief was, that in the case of the sale or other transfer of a railroad in violation of the resolution of 1843, the contractors and laborers had a right to pursue the property in the hands of the purchaser, yet there was no adequate remedy to enforce such right. Accordingly, the act of 1862 provided, that, after obtaining a judgment against the company a *scire facias* might issue upon said judgment, with notice to the purchaser. This gave the latter his day in court and enabled the creditor to sell and pass a good title. The act of 1862 did not enlarge the class of persons who are protected by the resolution of 1843. That this is so clearly appears by the remedy therein provided. It authorizes a *scire facias* to issue upon a judgment recovered against the company. How could a sub-contractor, or a laborer employed by a sub-contractor, get a judgment against the company? He has no contract relation therewith.*

6. In construing this law it has been decided that a civil engineer is not included, and consequently he is not entitled to the lien created by it for the benefit of workingmen and laborers.† Says Mr. Justice Gordon in Leuffer's case: "When we speak of the laboring or working classes, we certainly do not intend to include therein persons like civil engineers, the value of whose services rests rather in their scientific than in their physical ability. We thereby intend those who are engaged, not in head, but in hand work, and who depend upon such hand labor for their living. * * * This limited meaning has been invariably attached to them and similar words when used in our own statutes. In *Hebner v. Chave*‡ the act of 1845, prohibiting the attachment of laborers' wages, came up for construction, and it was held that the act was intended to secure to the manual laborer the fruits of his own work for the subsistence of himself and family, and that it did not embrace the earnings of a contractor. So, in *Smith v. Brooke*,§ 'wages of laborers' were defined to be the earnings of the laborer by his personal manual toil."||

7. "Any assignor, under whose assignment in trust for the benefit of creditors, either by general words or particular description, there have been transferred any articles of household furniture or things of domestic use, may, after the appraisement thereof, apply to the court of common pleas of the proper county, to have set aside for the use of said assignor and family, any of the said articles and things, not exceeding in value, at the appraisement thereof, three hundred dollars; and the court may, if no cause be shown to the contrary, after due notice to creditors, order that the same be released from the assigned estate and handed to the assignor."¶

*Hart's Appeal, 95, Pa. 355, § 375.

† Pennsylvania & Delaware R. Co. v. Leuffer, 84 Pa. 168.

‡5 Pa. 115.

§13 Wright 147.

|| See also *McBrooms & Woods' Appeal*, 44 Pa. 92.

¶ Purdon's Dig. 123, § 23.

BENEFICIAL SOCIETIES.

1. When not incorporated their members are liable as partners.
2. But they are not personally liable for benefits.
3. How benefits against an unincorporated society may be recovered.
4. Incorporated beneficial societies are not created for charitable uses.
5. Interpretation and application of the constitution of such societies.
6. Interpretation and application of the by-laws.
7. Contracts of such associations.
8. Construction of the certificates issued.
9. The powers and duties of members.
10. Expulsion and suspension of members.
11. Payment of benefits.
12. Actions to recover benefits.

1. Beneficial societies are either incorporated or unincorporated. When not incorporated their members are liable as partners for debts of their society, nor can one of them file a mechanic's lien against a building erected by the society which will avail against the lien of persons who are not members.*

2. Their liability formerly extended to the benefits due to a sick member.† But this has been removed by the following statute: "Members of lodges of the order of Odd Fellows, Knights of Pythias and other organizations paying periodical or funeral benefits, shall not be individually liable for the payment of periodical or funeral benefits or other liabilities of the lodge or other organization, but the same shall be payable only out of the treasury of such lodges or organizations: *Provided*, That the provisions of this act shall only apply to unincorporated associations: *And provided further*, That this act shall not apply to any liability heretofore incurred.§"

3. An action at law will not lie against an unincorporated beneficial society as an organization to recover benefits.|| Nor against the officers of such a society.¶ But a bill in equity will lie to compel the payment of weekly benefits.**

The constitution of an unincorporated beneficial society can be altered only in the mode prescribed by the articles of association.††

4. Passing to beneficial societies which are incorporated, we may remark that they are not created for a charitable use.‡‡

* *Babb v. Reed*, 5 Rawle 151; *Swift v. Beneficial Society*, 73 Pa. 362.

† *Pritchett v. Schaeffer*, 2 W. N. Cas. 317.

§ *Purdon's Dig.* 188; act of April 28, 1876, Pamphlet Laws 53.

|| *Paul v. Keystone Lodge*, 2 W. N. Cas. 408.

¶ *Kurtz v. Eggert*, 9 W. N. Cas. 417.

** *Leeders v. Volp*, 8 W. N. Cas. 417.

†† *Hochveiter's Appeal*, 99 Pa. 479.

‡‡ *Babb v. Reed*, 5 Rawle 151; *Swift v. Beneficial Society*, 73 Pa. 362.

5. These associations have constitutions and by-laws, and several decisions have been rendered concerning these regulations. For example, the constitution of a beneficial society declared that on the decease of a member a sum of money should be paid to his legal representatives, or to such person as he might appoint in writing, provided that he should have no power to deprive his widow or children of such benefit. Nevertheless, the fund was awarded to a niece, in whose favor the application for membership was made, in preference to a married daughter.*

Another constitution provided that a member might make a new direction of the fund, payable at his decease, but the application for directing this could only be made in the form prescribed.†

A constitution declared that a member should be entitled to benefits, "provided that he is not more than three months in arrears." This meant three month's dues, and not three months in arrears for any amount.‡

A husband was a member of a beneficial society, the constitution of which provided that the benefits should be paid to the widow to defray the expenses of the funeral. It was held that the money received by the widow was impressed with a trust to the extent that it was needed for funeral expenses, and her estate was liable to the estate of the husband for the amount of the funeral expenses paid by the administrator.§

A constitution provided that any member neglecting to make certain payments "after thirty days' notice" should cease to be a member. It was decided that the time of such notice must be calculated from its actual receipt and not from its date.||

6. Should the constitution and by-laws provide that a member shall receive no benefits until he executes a release to his employer of all damages, the execution of the release would be a bar to an action against him.¶

The by-laws of a society provided that the widow of a deceased member should receive a certain sum from the funds of the society, if his death was not caused by intemperance. This was decided to be a reasonable by-law and, therefore, when a death happened by this cause there could be no recovery. **

Another by-law provided that if a member should voluntarily enlist as a soldier he should forfeit his membership. It was held that this did not include the case of one who joined a volunteer corps mustered into the service of the federal government.††

* Folmer's Appeal, 87 Pa. 133.

† Vollman's Appeal, 92 Pa. 50.

‡ Scanlan v. Beneficial Society, 5 Mont. 180.

§ Martin's Estate, 2 Chest. 47.

|| Taggart v. Association, 4 Del. 217.

¶ Graft v. Railroad Co., 8 Atlantic 206.

** St. Mary's Beneficial Society v. Burford, 70 Pa. 357.

†† Franklin Beneficial Society v. Commonwealth, 10 Pa. 357.

A beneficial society has power to make a by-law suspending the payment of weekly benefits to sick members unless there be a specified amount in the treasury.*

Finally, whenever the words "total disability" are used in any by-law, they mean a total incapacity to earn a livelihood.†

7. In contracting for the payment of benefits an association "for the purpose of benefiting the widows and orphans of deceased members," may contract specially with a member for the payment of his benefits to other persons than his widow and orphans.‡

8. When the contract is made, a certificate is issued to the member describing, among other things, to whom the fund shall be paid. When this is made payable to the administrators of a member for the benefit of his minor children, at his death it is payable to their guardian.§ A mutual benefit association gave to one of its members a certificate which entitled his "wife, her heirs and assigns upon the death of the husband, to \$3,000." The wife died before the husband. It was held that husband's estate was entitled to share with his children.¶

Power to make rules and regulations that need the countersigning by a subordinate lodge does not invalidate certificates issued by the supreme lodge.**

9. Next may be described the powers and duties of members. A member is not regarded in law as a creditor of the society, and can only claim under the by-laws in existence at the time of his application.††

Membership in a railroad relief association cannot be established by the loose declarations of the paymaster of the railroad company.‡‡

For a wrong done to a member he must resort to the tribunals of the society whose judgment, when rendered by a fair application of the rules, is final.§§

By the laws of the Order of United Workmen the members have no individual right in the insurance fund, and on their death their administrators are not entitled to the insurance. So if a single member names his mother as a beneficiary, and she dies before him, and the member marries and dies leaving a widow, and without changing the beneficiary, the widow and not the estate of the mother is entitled to the insurance.|||| The same rule applies under the charter of the Knights of Birmingham.¶¶

* *Beneficial Society v. McVey*, 92 Pa. 510. See *McDowell v. Ackley*, 93 Pa. 277.

† *Relief Association v. Post*, 122 Pa. 579.

‡ *Maneely v. Knights*, 115 Pa. 305; *Lodge v. Martin*, 3 W. N. Cas. 160; *Knights v. Watson*, 15 Atlantic 125.

§ *Schmidt's Estate*, 30 Pitts. L. J. 126.

¶ *Aid Society v. Miller*, 107 Pa. 162.

** *Lodge v. Martin*, 13 W. N. Cas. 160.

†† *Beneficial Society v. McVey*, 92 Pa. 510, revsg. 36 Leg. Int. 157; *McDowell v. Ackley*, 93 Pa. 277.

‡‡ *Relief Association v. Post*, 122 Pa. 579.

§§ *McAlees v. Iron Hall*, 13 Atlantic 755.

|||| *Arthars v. Baird*, 8 Pa. Co. Ct. Rep. 67.

¶¶ *Id.*

10. For what cause may a member be expelled? It has been decided that embezzling is a vicious and indecent practice, for which a member can be expelled without any express power to do this in the charter. If a member had notice, appeared and was heard, and then expelled, in accordance with the rules of the society, the courts will not inquire into his guilt or innocence.* On the other hand, to be drunk while drawing benefits has been held to be not a sufficient ground for expulsion, unless the charter or by-laws should define such conduct as a cause for expulsion.†

A member is not liable of expulsion for a technical and unwitting violation of a rule of the society, and a court of equity will restore a member who has thus been illegally or improperly expelled.‡ Furthermore, when he has been improperly expelled and afterward restored he can also claim his benefits which have been denied to him, and the society can be compelled to account.§

Equity has power to inquire into the regularity of the proceedings by which a member has been suspended, but not into the merits if the proceedings were regular. If, however, the irregularities were waived at the time equity will not grant relief.¶

An expelled member who has been reinstated by a decree of the court, should notify the officers of the society of the court's action. Until he has done so he has no right in the society and cannot complain if he should be ejected from the room.**

11. Many questions have arisen relating to the payment of benefits; who are entitled; how much; whether they have been forfeited by the conduct of members, and other questions of a similar character. Thus, if funeral benefits be provided for only those entitled to sick benefits, and the latter are denied to members thirteen weeks in arrears, the member who is in arrears for this period when taken sick cannot acquire a right to funeral benefits by paying the arrears.†† And it has also been decided that a member who is not a beneficiary when taken sick cannot become so during his sickness by paying his arrearages.‡‡

Death benefits cannot be diverted into any other channel than that prescribed by the society.§§

The benefits on the death of the member are usually paid to the wife or children, though the member may contract for the payment of them to other persons. If the benefit be payable to the decedent's wife the

* *Commonwealth v. Beneficial Society*, 41 Leg. Int. 174.

† *Commonwealth v. Association*, 1 Montg. 101.

‡ *Glover v. Lodge*, 1 Del. 317. See *Worrilow's Appeal*, 1 Del. 409.

§ *Worrilow's Appeal*, 2 Del. 66.

¶ *Sperry Appeal*, 116 Pa. 391.

** *McAlfferty v. Sweeny*, 19 W. N. Cas. 396.

†† *Frey v. Knights*, 6 Pa. Co. Ct. Rep. 435.

‡‡ *Scanlan v. Beneficial Society*, 5 Montg. 180.

§§ *Naas' Estate*, 44 Leg. Int. 196, s. c. 3 Pa. Co. Ct. Rep. 345.

amount cannot be recovered by the administrator of the deceased member.*

When a husband designates his wife as a beneficiary, and they subsequently execute articles of separation, the death benefits will go to the wife, notwithstanding an attempted transfer by assignment and law.† And if the wife has been divorced the benefits are payable as though the member had been a widower and not an unmarried man.‡

An innocent payment of a death benefit to a person whom the deceased designated to be his wife, is a bar to the claim of the real widow.§

If there be no widow the fund payable on the death of the member goes to his children. The fund cannot be used for the payment of his debts.||

A wife who has separated herself from her husband for several years is not entitled to the allowance for funeral expenses.¶

With respect to the sickness or disability which entitles a member to receive benefits, it has been decided that insanity is such a disability.** If a member is not entitled to benefits until after a year's membership, and he becomes insane prior to that time, he does not become entitled to the benefits until after the expiration of this period.††

12. In an action for benefits only such can be recovered as were due when the writ was issued.‡‡ Again, in such an action, if the member has been expelled this is deemed conclusive of the merits of the case, including the member's sanity.§§ But should a member, in an action for sick benefits, not receive a fair hearing in the tribunals of the order, the cost might properly be put on the association, even though the master's finding should be in its favor.¶¶

* McNeill v. Golden Cross, 131 Pa. 339. See Beatty's Appeal, 122 Pa. 423.

† Jenks v. Lodge, 37 Pitts L. J. 446.

‡ Heyman v. Meyerhoff, 16 W. N. Cas. 212.

§ Supplee v. Knights, 18 W. N. Cas. 380.

|| Williams' Appeal, 92 Pa. 69.

¶ Bulfinch Beneficial Society v. March, 82 Pa. 166.

** McCullough v. Beneficial Association, 133 Pa. 142.

†† Id.

‡‡ Relief Association v. Post, 122 Pa. 579.

§§ Dood v. Armstrong, 43 Leg. Int. 270, s. c. 2 Pa. Co. Ct. Rep. 352.

¶¶ Taylor v. Knights, 4 Del. 153.

CO-OPERATIVE ASSOCIATIONS.*

1. Incorporation authorized. How formed. Purposes. Name.
2. Articles to be filed. Duplicates. Fees of secretary and recorder.
3. Five persons to sign articles. To be acknowledged. What must be set forth in articles.
4. Capital stock. Permanent. Ordinary. Amount of shares and how to be paid.
5. Monthly statement. False statement. Inspection of books and accounts.
6. Limitations of holdings of stock. Each member entitled to one vote. Partners.
7. Minors may hold shares. May vote.
8. Transactions to be for cash. Wages to be paid weekly. Sale of real estate. Interest. No lease for more than one year. Effect of giving credit.
9. Individual liability of members. When suit may be brought. Subrogation. Exemption.
10. Corporate powers.
11. Investments in other associations.
12. First meeting. Notice. By-laws. Election of officers. Terms. Other business. Duties of secretary.
13. Quarterly meetings. Business. Duties of directors. Accounts of receipts and payments. By whom signed. Copies posted. False statement.
14. Election of officers. Length of term. By-laws. Record of official actions.
15. Profits to be declared quarterly. Application of profits.
16. Business office. Service of process on.
17. Employes to give bonds.
18. Fines.
19. Embezzlement.
20. Amendment of articles and by-laws.
21. To be recorded and kept open for inspection. Books and copies to be evidence.
22. Co-operative associations already in existence. Rights and powers.
23. Dissolution prior to expiration of term. Notice to members. Votes and motions. Printed ballots to be mailed to each member. Contents. Resolution for winding up.

1. Co-operative associations, productive and distributive, may be incorporated under this act, upon compliance with its requirements, by any five or more farmers, mechanics, laborers, or other persons, who shall have associated themselves together by written articles of association, such as are hereinafter described, for the purpose of carrying on any agricultural, horticultural, mining, quarrying, building, mechanical, manufacturing or commercial, or for the purpose of manufacturing, cultivating, raising, trading or dealing in all kinds of goods, wares, merchandise, chattels, grain, vegetables, roots, fruits and other produce, or animals, for sale, food or other purposes, or for the purpose of buying, selling, holding, leasing or improving lands, tenements or buildings; and that such persons, so associating, may adopt any corporate name, indicating their co-operative character and which has not been previously

* Purdon's Digest, page 2165.

adopted by any other corporation, formed under this act: *Provided*, That the two last words of such name shall be "co-operative association," and that it shall not be lawful to use, in such name, either the words "society" or "company," and that any violation of this proviso by any corporation, formed under this act, shall render each member thereof personally liable for all its debts.

2. Before any association, formed under this act, shall commence its business, its articles of association shall be filed and recorded in the office of the Secretary of State of this state, and two copies of said articles shall be made, which the said Secretary of State shall certify by his official signature and the seal of this state as being correct copies of said articles so filed and recorded, one of said certified copies shall be filed and recorded in the office of the recorder of deeds of the county in which the principal office of the association shall be located, and the said recorder of deeds shall certify by his official signature and the seal of his office that the said certified copy of said articles has been filed and recorded in his office, and the other certified copy of said articles shall be held by the association named therein; and the said articles or copies thereof duly certified by either of the aforesaid officers may be used as evidence in all courts and places of the incorporation of as well as for or against such association; and the said Secretary of State and the said recorder of deeds shall each be paid for said filing, recording and certifying, at the rate of ten cents for each one hundred words contained in said articles; and after such articles of association shall have been made, filed and recorded, as herein required, the persons signing the same, and such other persons, partnership or corporations, who shall, from time to time, own and possess any share or shares in the stock capital of such association, and their several successors and assigns, shall be deemed and taken to be a body corporate and politic, by the name and for the purposes mentioned in such articles of association.

3. The articles of association shall be signed by the persons originally associating themselves together, and shall be acknowledged by at least five of them, before a notary public, and shall state distinctly:

First. The name by which such association shall be known.

Second. The place in this state where its principal office is to be located.

Third. The purpose or object for which it is formed.

Fourth. Whether its stock capital is fixed, and if so, what amount, or whether such capital is to be of an amount, varying, from time to time, as the business may require.

Fifth. The amount of each share of permanent stock and ordinary stock of such capital, and how such shares may be paid for.

Sixth. The amount of capital that will be actually paid in before commencing business

Seventh. The terms on which persons may become members.

Eighth. On what days in January, April, July and October, regular or quarterly meetings of the members are to be held.

Ninth. Such other matters, not repugnant to this act, as may be deemed proper and necessary.

Tenth. The term of its existence, not to exceed thirty years; and,

Eleventh. The names of the first associates, their respective residences and the number and class of shares held by each of them.

4. The stock capital of any such association shall consist of the amounts standing to the credit of members on account of the shares allotted to them, certificates for which shall be issued, from time to time, as such share may have become fully paid up; and there may be two classes of shares, one of which classes shall be styled and known as "permanent stock," which shall not be withdrawable but may be transferred, subject to the by-laws of such association, and each member thereof shall take and hold at least one share of said permanent stock; and the other class of shares may be styled and known as "ordinary stock," which may be repaid, transferred or withdrawn, in accordance with the by-laws of such association; and the shares of either class may be of amounts not less than five nor more than twenty-five dollars each, and may be paid for in one sum, or by periodical instalments, or by occasional subscriptions, or by the interest thereon, or by profit dividends.

5. It shall be the duty of any such association to exhibit in some conspicuous place, in its principal office, not later than three o'clock post meridian, on the first business day of every month, and to continue the same in such place until the next exhibit shall be thus made, a statement showing correctly and distinctly the amount of such invested stock capital, and what proportion such stock capital bears to such loans or deposits, such statement to be made up to the close of the next preceding month, and to be signed by the president and treasurer, or by any two of the directors, and to be attested by the secretary and auditors of such association, and if any of such officers as aforesaid shall wilfully make or knowingly consent to any false statement in such exhibit, he shall, by so doing, be deemed to have committed a misdemeanor, and shall, upon conviction thereof, be punished as provided in section thirteen of this act: *Provided*, Any member or other person having an interest in the funds of such association, or any person legally authorized to assess property for taxes, may inspect its books and accounts during the official business hours, but no such member, person or assessor, unless he be an officer of such association, or be specially authorized by a resolution thereof, shall have the right to inspect the share or other account of any other member or person, without his written consent.

6. The amount of stock capital of such association to be taken, held or claimed at any one time by any person or persons, jointly or by part-

nerships, or by corporations, shall not exceed one thousand dollars, except consent therefor be voted by the members, at any regular quarterly meeting thereof, nor shall any member, upon any subject at any meeting, be entitled to more than one vote, which shall be given in person and not by proxy, and any stock capital held by persons jointly or by partnerships, or by corporations, shall be voted upon as if held by one person only respectively, and subject to the by-laws of such association.

7. It shall be lawful, if the by-laws so provide, for any minor to take and hold shares in or to make loans or deposits of money to or with any such association, and for such association to pay to any minor any moneys that may be due to him in respect of any such shares, loans or deposits standing in his name, and his receipt therefor shall be in all respects valid in law, but such minor shall not be eligible to hold any office in such association, though he may, subject to its by-laws, vote at any meeting of its members.

8. Any such association may buy from, sell to and trade or deal with any of its members, or other persons, partnerships or corporations, but all transactions shall be for cash, and no credit shall either be given or taken, except that such association may contract for and pay the wages and salaries of its employes once in each week in cash, and except such association may sell real estate, improved or otherwise, on such terms that at least one-fourth of the agreed price shall be paid in cash, at the time of sale, and that not more than three-fourths of the agreed price, together with interest on the amount of principal, interest and charges owing, from time to time, a rate not exceeding six per centum per annum, may be secured by bond and mortgage, or by promissory notes and mortgages, and be made payable by fixed and equal periodical instalments: *Provided however*, That such association may take or grant leases of real estate for such terms as may be agreed upon, but no such lease for any time exceeding one year, or creating a credit or liability for any sum exceeding three hundred dollars, shall be lawful or valid until the same shall be approved by a vote of the members at any regular quarterly meeting thereof: *And provided further*, That any credit given to any such association in violation of the provisions of this act shall cause a forfeiture of any credit thus illegally given, and that a notice to such effect shall be published, by such association, on its letter and bill heads, advertisements and other publications.

9. The members shall be severally and jointly liable for all debts for labor or other services of any kind performed for such association, and for any other debts lawfully incurred under the provisions of this act each of the members shall be liable to the amount of his unpaid stock capital and no more, but no suit shall be brought or any execution issued against any member individually until a judgment be first obtained for such labor, services, or any other lawful debts against such associa-

tion, and execution thereon be returned unsatisfied in whole or in part; and in case any member shall be compelled to pay any such judgment, or any part thereof, beyond his *pro rata* liability therefor, he shall have the right to call upon all the members to pay their *pro rata* share of the same, or up to their *pro rata* liability therefor, and may sue them jointly or severally, or any number of them, and recover in such action the ratable amount due from the member or members so sued: *And it is hereby provided*, That stock capital to the extent of twenty-five dollars belonging to any member in such association, who is a householder and has a family, shall not be subject to attachment or execution, or liable in garnishment for his individual debts.

10. Any such association may carry on its business, or any part thereof, at any one or more places within this state; and may take, hold, lease and convey such personal and mixed estate as may be necessary for the purposes of its organization; and may sue and be sued in its corporate name, and may submit any matter in dispute to arbitration; and shall have a common seal, which shall not be altered or imitated, and shall bear the corporate name of, together with such device or motto as may be adopted by such association, and such seal shall be impressed upon the articles of association; and any such association may, for all and every and any of the purposes of its organization and for every and any other purpose incidental thereto, or in this act mentioned or referred to, lay out and use its capital or other moneys and property for the time being, or any part thereof, with power to do, authorize and exercise all acts and powers whatsoever in the opinion of the directors of such association requisite or expedient to be done or exercised in relation thereto.

11. Any such association may, by a majority vote of its members, at any meeting specially convened therefor, authorize the directors thereof, to invest, in the name of such association, such an amount of its stock capital or reserve fund, and on such terms as such meetings shall determine, in the stock capital if any other duly incorporated co-operative associations in this state, or in any other state or country, and any such association may, by a like vote, permit an investment in its stock capital by any other co-operative association duly incorporated in this state, or in any other state or country: *Provided*, That the original laws of such associations permit or authorize such investments.

12. The first meeting of any such association may be called by a notice signed by any two of the associates, setting forth the time, place and object of such meeting; such notice to be mailed to the address of each associate at least four clear days prior to such meeting, and a majority of such associates at such meeting shall be competent to make all such by-laws as they may deem necessary for the proper management of the business, property and affairs of such association, so that such by-laws are not repugnant to or inconsistent with the provisions of

this act, or of any law of this state and of the United States, to elect the first president and secretary, both of whom shall be directors *ex-officio*, treasurer, and either six, eight or ten directors and two auditors, all of whom shall be members of such association, and hold their offices until their successors shall have been elected in accordance with section fifteen of this act, and to transact any other business necessary for the organization of such association and appropriate to such meeting; and the secretary of such meeting shall make full and correct minutes of its proceedings upon the books of such association and the same, being signed by its chairman, shall be deemed and taken to be *prima facie* evidence of the action of such meeting.

13. Every such association shall hold regular quarterly meetings of its members in the months of January, April, July and October, at such place as the directors shall determine and publish, for the purpose of considering and determining upon any matter, not requiring special notice, relating to the business of such association, and at each quarterly meeting the directors shall present a full and complete report, signed by the president, of such association's transactions during the last preceding quarter, accompanied by such information and suggestions in relation to the affairs of such association and to the future management thereof as may be for the best interest of the association; and they shall also present, at each quarterly meeting, an account of all cash receipts and payments and of the losses and gains of such association for the last preceding quarter, and also a general statement of balance sheet of such association's funds and effects, liabilities and assets as at the close of the last business day of said quarter, and such account and general statement shall be signed by the president and treasurer, and be attested by the secretaries and auditors of such association; and a copy of such report, account and general statement shall be kept posted up, for three months at least, in a conspicuous place in the principal office and other places of business of such association; and any director, president, treasurer, secretary, auditor or other officer, who shall include or knowingly consent to any false statement in such report, account or general statement, or in any other statement required to be made by this act, or by any vote of the members at any meeting thereof, shall be deemed guilty of a misdemeanor, and, upon conviction thereof, be punished by a fine of not more than one thousand dollars, or by imprisonment in the state prison for not more than one year, or by both such fine and imprisonment, in the discretion of the court.

14. After the first election of the directors, officers and auditors, as provided in section twelve of this act, the president, secretary, treasurer and one-half of the directors and auditors shall be elected at the quarterly meeting in January, and the other half of the directors and auditors shall be elected at the quarterly meeting in July, and shall hold the several offices for one year, or until their successors are elected, and the

directors shall decide by lot or otherwise, as they may deem best, who shall constitute the first half of the directors and auditors to retire at the first election that may be made at a quarterly meeting aforesaid. The by-laws of such association shall provide how nominations shall be made and votes be taken for president, secretary, treasurer, directors and auditors, and also their eligibility and qualifications for their several duties, responsibilities and remunerations, and for their removal from office for good and sufficient cause: *Provided*, That each of the official acts of the board of directors shall be by a majority vote of all the directors elect, and shall be recorded, with the ayes and nays thereon, in the minute book of such association.

15. The profits shall be ascertained and declared on all business carried on in each department or branch, or by, or for, or on account of any such association for each quarter year ending with the months of March, June, September and December, and the profits realized shall be applied as follows:

First. In reduction of the value of the fixed stock and plant of such association at the annual rate of ten per centum, or more, on fixtures, machinery, tools, et cetera, and of two and one-half per centum, or more, on warehouses, stores or other buildings, as the directors shall determine and order.

Second. In the reduction of the preliminary expenses, if any, incurred in the formation of such association and remaining unwritten off in its books at such rate, being not less than five per centum per annum, as the directors shall determine and order.

Third. In the providing for or payment of interest, at the annual rate of six per centum, on permanent stock and five per centum on ordinary stock and the reserve fund: *Provided however*, That such interest shall be credited to each member, but shall not be paid until his stock is fully paid up.

Fourth. In forming, by applying such sum or percentage of the net or remaining profit after providing for the preceding charges as the directors shall determine and order, a reserve fund, to which also all fines and forfeitures shall be carried, applicable as follows: First, to the equalization of dividend; second, to meet any other contingency affecting the business of such association; and, third, to any other purpose as may be voted by the members, on the recommendation of the directors.

Fifth. In forming and maintaining a propaganda and social fund, to which shall be credited such sum, being not less than two and one-half per centum of the net profits, as the directors shall determine and order.

Sixth. And the remainder of the net profits shall be divided as follows: On the wages and salaries of employes the same rate, and on the purchases by non-members one-half of the rate that may be allotted on the purchases by members, such wages or salaries to be the amount earned, and such purchases to be the amount actually paid for in cash during

the period to which such division relates: *Provided*, That no profit dividends shall be allowed on the purchases of such articles as the directors may have given previous notice of their intention to exclude from participation in profits: *And provided further*, That all such profit dividends shall be credited to such members, non-members and employees, respectively, to accumulate and be applied in or toward the payment of shares of permanent stock or ordinary stock, as the directors may from time to time determine and order the issue of paid-up certificates therefor, until the amount of stock capital held by such members individually reaches the limit allowed by this act; after which the profit dividends may be paid to such members as shall be provided for in the by-laws of such association.

16. Every such association shall have a regular business office to which all communications and notices shall be addressed; and service of any legal process on any such association shall be made by leaving at such office a true copy of such process with any director, officer, clerk or agent of such association; and in case such office shall be kept closed against such service, then service of such process may be made on such association by giving a true copy thereof to any of its directors or officers if found in the county wherein such office is located; and if on a return of such a process, it appears that such office is kept closed, or that such directors or officers could not be found within the said county, then such process may be served on such association by serving a true copy thereof on any of its directors or officers wherever found in this state; and failing in that and on a return made to such effect, the court may order such publication, as it may deem requisite to be made in the premises, for at least one month in at least one newspaper published at or as near as may be to the place where the principal office of such association is located, and proof of such publication shall be held to be due service on such association.

17. Every person appointed to any position in any association requiring the receipt, payment, management or use of money, belonging to such association, shall, before entering upon the discharge of his duties, become bound, with two or more good and sufficient sureties, in such sum and form as the directors shall require and approve; and the directors may also require from any other employees of such association bonds, with good and sufficient sureties, for the faithful discharge of their duties.

18. Any such association may charge any of its members, employees or other persons doing business with it, by way of fine, for any breach or non-observance of its by-laws, or any of its business rules and regulations, such reasonable sum, not more than five dollars for each offense, as the directors may determine and order, and all such fines shall be due and payable forthwith, and if not paid, the same may be deducted from any moneys due, credited or accruing to the parties so offending.

19. If any director, officer, clerk, agent or other person in the employment of any such association, shall embezzle or fraudulently dispose of or convert to his own use, or shall take or secrete, with intent to embezzle and convert to his own use, any money or other property of such association, or of any of its dealers or customers, which shall have come into his possession, or shall be under his charge by virtue of such office or employment, or otherwise, he shall be deemed, by so doing, to have committed the crime of embezzlement, and shall, upon conviction thereof, be punished as the law directs.

20. Any such association may alter or amend its articles of association, and may alter or rescind any by-law, or make any additional by-law, with the consent of a majority of its members present at a special meeting convened for such purpose, but the notice calling such meeting shall set forth fully and clearly the proposed alteration, amendment, rescission or addition; and any alteration or amendment of the articles of association shall be filed, recorded and certified in the same manner as the original articles of association.

21. The articles of association and by-laws, and any amendments thereto or alterations therein, respectively, of any such association shall be recorded in a book to be kept for that purpose, and such book shall be open during business hours at the principal office of such association for the inspection of its members and other persons having an interest in its funds, and such articles of association, by-laws and amendments thereto and alterations therein, respectively, so recorded, shall be binding on such association, its directors, officers, members and employes, and on all other persons having an interest in the funds of or dealing with such association, and all persons claiming on account of any or either of them, or under such articles of association, by-laws or amendments thereto or alterations therein, respectively, to the same extent as if each and every such person had subscribed his name and affixed his seal thereto and there were in such articles of association, by-laws, or amendments thereto or alterations therein, respectively, contained a covenant on the the part of himself, his heirs, executors, administrators and assigns to conform to such articles of association, by-laws and amendments thereto or alterations therein, respectively, subject the provisions of this act, all of whom shall be deemed and taken to have full notice thereof by such record as aforesaid, and the entry of such articles of association, by-laws and amendments thereto, or alterations therein, respectively, in the books of such association or a true copy of the same, examined with the original and proved to be a true copy, shall be received as evidence thereof in all courts and places.

22. Any co-operative association now in existence in this state, whether incorporated or unincorporated, shall be entitled to all the benefits of this act by complying with its provisions, and may, by a vote of the majority of the members of such co-operative association to be taken ac-

according to its existing articles of association or by-laws, determine to avail itself of the provisions of this act and to take and assume corporate name and powers thereunder, and may, by a like vote, transfer to such association, so formed under this act, all its property, real, personal and mixed, and thereupon such association, to which said property is so transferred, shall take the same in the same manner to the same extent and with the like effect as the same was previously owned and held by the association so transferring the same, and may, in its corporate name, sue for and collect all dues and demands, subscriptions and other benefits belonging to such original incorporated or unincorporated association: *Provided however*, That such association so taking such property as aforesaid shall take the same subject to all liens and trusts, both legal and equitable, to which the same was subject before such transfer, and shall also be liable for all debts and obligations of such previous association and shall pay the same to the full extent of the value of such property at the same time of so taking the same.

23. Any such association desiring for any reason to be dissolved prior to the expiration of the term of years specified in its articles of association may, by a resolution passed at a special meeting therefor, by a majority vote of all the members of such association, authorize its directors, or a special committee of members, to prepare or have prepared a full and true exhibit of the affairs, property and condition of such association, including an itemized statement of all its assets and liabilities, and also to report whether, in the opinion of such directors or committee, it would be best to continue or close up any or all of the business of such association, and, in the latter case, to recommend such methods and means as in their judgment would be best adapted for closing up such business; such exhibit, report and recommendation to be printed and a copy thereof to be mailed, postage prepaid, to the last recorded address of every member of such association, together with a notice from the president of such directors, or chairman of such committee, as the case may be, convening a special meeting of the members to be held at such time, being not less than ten nor more than fifteen days from the date of mailing such notice, as such directors or committee shall determine and order, for the purpose of considering and acting on such exhibit, report and recommendation, as to such special meeting as shall seem best: *Provided*, That all votes taken on such recommendation at such special meeting shall be by ballot and that it shall require three-fourths of all the ballots cast to carry any motion for the winding up and dissolution of such association: *Provided also*, That such president or chairman as aforesaid shall mail to every member of such association, along with the notice for the last mentioned special meeting, a printed form of ballot for the use of such members as may be unable to attend at such special meeting, on which shall be printed two questions as near as may be in the following words: Are you in favor of the winding up and dissolu-

tion of the association? Answer yes or no. Are you in favor of the plan as recommended for those purposes? Answer yes or no. And such answers shall be signed by the members so answering, and such ballots may be addressed and mailed, postage prepaid, or be personally delivered to such president or chairman as aforesaid at the principal office of such association; and all such ballots so received prior to or at the time appointed for such special meeting shall be opened and counted by the scrutineers or tellers appointed by such special meeting along with the ballots cast on the same or like questions by the members present at such special meeting: *And provided further*, That in the event of a resolution being passed, as aforesaid, by such special meeting, for the winding up and dissolution of such association, a copy of such resolution, duly certified by the official signature of the president and secretary and sealed with the common seal of such association, shall be given to, and shall contain full instructions and authority for the parties to be named therein to assume and discharge the duties entrusted to them by such resolution; and upon the completion of such duties by such parties, they shall make a certificate, signed and sworn to by them before a notary public, upon such certified copy of the aforesaid resolution, that they have truly and faithfully discharged all the duties entrusted to them thereby, and that they have realized all the assets and settled all the liabilities of such association in accordance with the instructions and authority given to them by such resolution; and such certificate and certified copy of such resolution shall be filed by such parties in the office of the Secretary of State of this state, and of the recorder of deeds of the county wherein the principal office of such association was located, and such certificate and certified copy of resolutions shall be recorded by the said secretary and the recorder of deeds in like manner as the articles of association of such association were recorded.

TRADES-UNIONS.*

1. They may be incorporated.
2. Applications when all reside in one county. Form of petition to the court.
3. Application to Governor when they reside in different counties.
4. Duty of the Governor.
5. Powers of the association.
6. Embezzlement by the officers and penalty therefor.
7. Refusal of officers to surrender seal to successor.
8. When employes may refuse to work. Limitation of the provision.

1. From and after the passage of this act five or more employes, at least three of whom shall be citizens of the United States, may, by their agreement and upon a compliance with the provisions of this act, form themselves into an association for their mutual aid and benefit and protection in their trade concerns.

2. When such association is to include employes residing only in one county of this commonwealth, a petition in the following form, or substantially so, may be presented to the court of common pleas of such county:

To the honorable the court of common pleas of ——— county:

The petition of the undersigned respectively shows:

First. That they are employes and residents of the county of ———.

Second. That three of your petitioners are citizens of the United States.

Third. That they have agreed to form themselves into an association for their mutual aid, benefit and protection, in their trade concerns.

Fourth. That the name of said association is to be ———.

Fifth. That said association is to include only employes who are residents of said county.

Sixth. The chief office of said association is to be located at ———, said county.

Your petitioners therefore pray your honorable court to grant them a charter for such association.

And they will ever pray.

_____,
_____,
_____,
_____,

(Signatures of petitioners.)

STATE OF PENNSYLVANIA, }
COUNTY OF ——— } ss.

Before me, ———, in and for said county, personally appeared

—, the foregoing petitioners, who being duly —, depose and say that the facts set forth in the foregoing petition are true.

— and subscribed to, this — }
day of — Anno Domini —.

_____,
_____,
_____,
_____,
_____.

(Signatures of affiants.)

3. When such association is to include employes residing in more than one county of this commonwealth, an application for a charter for the same may be made to the Governor in the same, or substantially the same, form as to a court, excepting a change in the address thereof and an averment that the association is to include employes residing in more than one county of this commonwealth.

4. Upon the presentation of a petition or application as aforesaid, it shall be the duty of the court or of the Governor, to mark the same "granted" and file the same of record in the proper office, and on request a certified copy thereof, on the payment of a reasonable fee therefor, shall be given to the petitioners.

5. An association authorized by this act, by virtue of its charter, shall have the following power:—

First. To have succession by its associated name for the period limited by its charter, and when no period is limited thereby or by this act, perpetually, subject to the power of the general assembly under the constitution of this commonwealth.

Second. To maintain and defend judicial proceedings.

Third. To make and use a common seal and alter the same at pleasure.

Fourth. To purchase, hold and transfer such real estate and personal property as the purposes of the corporation may require.

Fifth. To elect or appoint and compensate such officers or agents as the business of such association may require.

Sixth. To establish a constitution and adopt by-laws and rules, not inconsistent with law, for the management of its property, and the conduct and regulation of its affairs.

Seventh. To enter into any obligation necessary to the transaction of its business.

Eighth. To organize and establish, for the purpose mentioned in section one of this act, such subordinate associations of employes as shall apply therefor, under such reasonable rules, regulations and restrictions, as may, by the parent association, be deemed necessary.

6. Any officer, agent or member of such association, or of any such subordinate association, who shall fraudulently take, keep or convert to his own use, or to the use of another, any money or other thing of value, given to, collected for, or due, or belonging to such association, or which

is to be sent, paid or delivered by such officer, agent or member, to any person, firm or corporation, on behalf of such association, shall be deemed guilty of a misdemeanor, and on conviction thereof shall be sentenced to restore the property, unless already restored, and to be imprisoned in the county jail or work-house for any period not exceeding one year, or to pay a fine of not more than five hundred dollars, or both or either, at the discretion of the court.

7. Any officer, agent or member of such association, or of any such subordinate association, who shall wilfully keep, secrete, mutilate or destroy, or refuse to turn over to his successor, duly elected or appointed, or to the proper authority as provided by the constitution or by-laws thereof, any seal, minute-book, record, ledger, voucher or other book or books, paper or papers, or any article of personal property belonging or pertaining to the affairs of such association, shall be deemed guilty of a misdemeanor, and on conviction thereof shall be sentenced to restore to the proper authority such article or articles and to undergo an imprisonment for a period not exceeding six months, or to be fined in any sum not exceeding three hundred dollars, or both, or either, at the discretion of the court.

8. It shall be lawful for employes, acting either as individuals or collectively, or as the members of any club, assembly, association or organization, to refuse to work or labor for any person, persons, corporation or corporations, whenever in his, her or their opinion the wages paid are insufficient, or his, her or their treatment is offensive or unjust, or whenever the continued labor or work by him, her or them would be contrary to the constitution, rules, regulations, by-laws, resolution or resolutions of any club, assembly, association, organization or meeting of which he, she or they may be a member or may have attended, and as such individuals or members or as having attended any meeting which shall be lawful for him, her or them to devise and adopt ways and means to make such rules, regulations, by-laws, resolution or resolutions effective, without subjecting them to indictment for conspiracy at common law or under the criminal laws of this commonwealth: *Provided, first.* That this act shall not be held to apply to the member or members of any club, assembly, association, organization or meeting, the constitution, rules, regulations, by-laws, resolution or resolutions of which are not in conformity with the constitution of the United States and to the constitution of this commonwealth: *Provided, second.* That nothing herein contained shall prevent the prosecution and punishment, under any law, other than that of conspiracy, of any person or persons who shall, by the use of force, threats or menace of harm to person or property, hinder or attempt to hinder any person or persons who may desire to labor or work for employer from so doing for such wages and upon such terms and conditions as he, she or they may deem proper: *And provided, third.* That nothing herein contained shall prevent the prosecution and punishment of any persons conspiring to commit a felony.

MECHANICS' UNIONS.*

1. Mechanics' unions legalized.
2. They are not indictable as conspiracies.
3. Statutory construction of the above provision.

1. It shall be lawful for any and all classes of mechanics, journeymen, tradesmen and laborers to form societies and associations for their mutual aid, benefit and protection, and peaceably to meet, discuss and establish all necessary by-laws, rules and regulations to carry out the same; all acts or parts of acts inconsistent herewith are hereby repealed: *Provided*, The provisions of this act shall not apply to the counties of Clearfield and Centre.

2. It shall be lawful for any labor or laborers, workingman or workmen, journeyman or journeymen, acting either as individuals or as the member of any club, society or association, to refuse to work or labor for any person or persons, whenever, in his, her or their opinion, the wages paid are insufficient, or the treatment of such laborer or laborers, workingman or workingmen, journeyman or journeymen, by his, her or their employer is brutal or offensive or the continued labor by such laborer or laborers, workingman or workingmen, journeyman or journeymen, would be contrary to the rules, regulations or by-laws of any club, society or organization to which he, she or they might belong, without subjecting any person or persons so refusing to work or labor, to prosecution or indictment for conspiracy, under the criminal laws of this commonwealth: *Provided*, That this act shall not be held to apply to the member or members of any club, society or organization, the constitution, by-laws, rules and regulations of which, are not in strict conformity to the Constitution of the State of Pennsylvania, and to the Constitution of the United States: *Provided*, That nothing herein contained shall prevent the prosecution and punishment, under existing laws, of any person or persons who shall, in any way, hinder persons who desire to labor for their employer from so doing, or other persons from being employed as laborers.

3. The second proviso in the first section of said act, shall be so construed that the use of lawful or peaceful means, having for their object a lawful purpose, shall not be regarded as "in any way hindering" persons who desire to labor; and that the use of force, threat or menace of harm to persons or property, shall alone be regarded as in any way hindering persons who desire to labor for their employers from so doing, or other persons from being employed as laborers.

*Purdons' Dig. 1172.

MINERS.*

1. They are to be paid for the quantity of coal mined irrespective of size. Standard weight and measure. Contracts for measuring.
2. Cars are to be of uniform capacity and branded by mine inspector. Penalty for violation. Duties of mine inspector.
3. Check-weighman and measurer may be employed. His powers and duties. Difficulties to be settled by mine inspector. Expenses and penalties.
4. Wilful neglect to pay for all clean coal declared to be a misdemeanor.
5. Punishment for violating the law.

1. Any miner employed by an individual, firm or corporation for the purpose of mining coal, shall be entitled to receive from his employer, and failing to receive, then to collect, by due process of law, at such rates as may have been agreed upon between the employer and employed, full and exact wages accruing to him for the mining of all sizes of merchantable coal so mined by him, whether the same shall exist in the form of nut or lump coal; and in the adjudication of such wages, seventy-six pounds shall be deemed one bushel, and two thousand pounds net, shall be deemed one ton of coal: *Provided*, That nothing contained in this act shall be construed to prevent operators and miners contracting for any method of measuring and screening the coal mined by such miners, as they may contract for.

2. At every bituminous coal mine in this commonwealth, where coal is mined by measurement, all cars, filled by miners or their laborers, shall be uniform in capacity at each mine; no unbranded car or cars shall enter the mine for a longer period than three months, without being branded by the mine inspector of the district, where the mine is situated; and any owner or owners, or their agents, violating the provisions of this section, shall be subject to a fine of not less than one dollar per car, for each and every day, as long as the car is not in conformity with this act; and the mine inspector of the district where the mine is located, on receiving notice from the check-measurer or any five miners working in the mines, that a car or cars are not properly branded, or not uniform in capacity, according to law, are used in the mine where he or they are employed, then, inside of three days from the date of receiving said notice, it shall be his duty to enforce the provisions of this section, under penalty of ten dollars for each and every day he permits such car or cars to enter the mine: *Provided*, That nothing contained in this section shall be construed or applied to those mines who (that) do not use more than ten cars.

3. At every bituminous coal mine in this commonwealth, where coal is

* Purdon's Dig. 1175.

mined by weight or measure, the miners, or a majority of those present at a meeting called for that purpose, shall have the right to employ a competent person as check-weighman or check-measurer, as the case may require, who shall be permitted at all times to be present at the weighing or measurement of coal, also have power to weigh or measure the same, and during the regular working hours, to have the privilege to balance and examine the scales or measure the cars: *Provided*, That all such balancing and examination of scales shall only be done in such way, and in such time, as in no way to interfere with the regular working of the mine. And he shall not be considered a trespasser during working hours while attending to the interests of his employers. And in no manner shall he be interfered with or intimidated by any person, agent, owner or miner. And any person violating these provisions shall be held and deemed guilty of a misdemeanor, and upon conviction thereof, he shall be punished by a fine of not less than twenty dollars, and not exceeding one hundred dollars, or imprisonment at the discretion of the court. It shall be a further duty of check-weighman or check-measurer, to credit each miner with all merchantable coal mined by him on a proper sheet or book to be kept by him for that purpose. When differences arise between the check-weighman or check-measurer and the agent or owners of the mine, as to the uniformity, capacity or correctness of scales or cars used, the same shall be referred to the mine inspector of the district where the mine is located, whose duty it shall be to regulate the same at once; and in the event of said scales or cars proving to be correct, then the party or parties applying for the testing thereof to bear all costs and expenses thereof; but if not correct, then the owner or owners of said mine to pay the cost and charges of making said examination: *Provided further*, That should any weighman or weighmen, agent or check-measurer, whether employed by operators or miners, knowingly or wilfully adopt or take more or less pounds for a bushel or ton than as provided for in the first section of this act, or wilfully neglect the balancing or examining of the scales or cars, or knowingly and wilfully weigh coal with an incorrect scale, he shall be guilty of a misdemeanor, and upon conviction thereof, shall be imprisoned in the county jail for three months.

4. All individuals, firms and corporations engaged in mining coal in the commonwealth, who, instead of dumping all the cars that come from the mine into a breaker or chutes, shall switch out one or more of the cars for the purpose of examining them, and determining the actual amount of slate or refuse, by removing said slate or refuse from the car, and who shall, after so doing, wilfully neglect to allow the miner in full for all clean coal left after the refuse, dirt or slate is taken out, at the same rate paid at the mine for clean coal, less the actual expense of removing said slate or refuse, (he) shall be deemed guilty of a misdemeanor.

5. Any individual, firm or corporation as aforesaid, violating the provisions of this act, upon suit being brought and conviction had, shall be sentenced by the court to pay a fine of not more than one hundred dollars, and to make restitution by paying to the miner the amount to which, under this act, he would be entitled for the coal mined by him, and for which he was not paid.

LEGISLATION RELATING TO THE BUREAU OF INDUSTRIAL STATISTICS.

COLLECTION OF MINERAL STATISTICS.*

SECTION 1. *Be it enacted, etc.*, That in addition to the information now required to be furnished to the Auditor General by the several railroad and canal companies of this commonwealth, each of said railroad and canal companies, when their railroad or canal passes through any of the coal regions of the state, shall report for the year one thousand eight hundred and seventy-one, and annually as soon after the first day of January in each year, or the close of the fiscal year of said companies, as the information can be procured, under oath of one of the officers of said company, to the Auditor General, the quantity of coal of each kind, and of coke, in tons of two thousand pounds each, received for transportation at each station on every such railroad and at each coal-shipping point on said canal, distinguishing in said report the quantities received direct from the mines from that received from other railroad or canals, giving the name of said connecting railroad or canals in such a manner that the amount of the production of coal on the line of said railroad or canal may be correctly ascertained; the Monongahela Slack-Water Navigation Company, and all other slack-water navigation companies engaged in conveying coal or coke, are also hereby required to make returns in the same manner as is hereinbefore required of railroads and canal companies.

SECTION 2. It shall also be the duty of each of said railroad companies to report the quantity of coal purchased or mined for their own use in this state by them during each year, and which was produced along the line of said railroad, and stating at what place or places the same was mined, and which was not included in the reports of coal received for transportation before mentioned of said railroad or of any other railroad or canal.

SECTION 3. It shall be the duty of all coal-mining companies or firms, and individuals working mines, and of all state and county officers, to furnish the Auditor General, in answer to his letters or circulars, all information in their possession in regard to the quantity of coal mined that is sent to market direct by any navigable river, or used by any rolling-mill, blast-furnaces, salt-works, or otherwise, and which is not transported to any railroad, canal, or slack-water navigation company,

* May 9, 1871, Pamphlet Laws, 261, Purdon's Digest, 1442.

and also to inform him when and of whom correct information as to the coal production of any such locality can be procured; and, further, to inform him of all accidents in mines in counties where there is no mine inspector appointed by law, and how the same was caused.

SECTION 4. It shall be the duty of the Auditor General, on receiving said reports, and such other authentic information as he shall collect, to collate said reports and information, and make a report, giving the results only in tabular form, showing the quantity of coal mined during each year in each county and in each important coal-producing region in a perspicuous form, separating the several kinds of coal into anthracite, semi-bituminous, bituminous, and splint or block coal, suitable for smelting iron, giving also from time to time the statistics of each region from the beginning of its coal trade so far as it can be ascertained; he shall also specially report the number of accidents resulting in death or injury in coal mines in those counties where there is no mine inspector, classifying them according to the cause thereof, whether occasioned by fire, explosions, falls of roof or coal in shafts or slopes, or other causes under ground or at the surface.

SECTION 5. The Auditor General shall also, in the same manner, collect statistics, collate, classify and report at the same time, the quantities of petroleum, salt, iron ore, zinc, and other mineral productions of the commonwealth; also the pig-iron, merchant, or wrought-iron manufactured in the commonwealth.

SECTION 6. Eight thousand copies of said report of the Auditor General, together with the suggestions on the workings of existing laws and his propositions as to new enactments, shall be published for distribution, annually, as soon as it is prepared, with the title of the Mineral Statistics of Pennsylvania; and one copy thereof shall be sent by mail, by the Auditor General, to each person who shall have furnished him with information as aforesaid, and the balance shall be delivered to the legislature for distribution.

SECTION 7. Any railroad or canal, or slack-water navigation company, or coal mining company, firm or individual engaged in mining, or any county officer who shall neglect or refuse, for thirty days, to make report or give the information required by this act, shall be liable to a penalty of one hundred dollars, to be recovered by the order of the Auditor General, in an action of debt in which the commonwealth shall be plaintiff, by the district attorney of the proper county, the one-half thereof to go to said district attorney and the other half for the use of the proper poor district.

SECTION 3. That hereafter the Secretary of Internal Affairs, in lieu of the Auditor General, shall send out the blanks required by the act of May, 9, 1871, entitled "An act for the collection of mineral statistics," and said secretary shall do and perform all the duties enjoined in said act in

regard to the collecting, compiling and publishing a report of the same number of copies ordered to be published by the Auditor General.*

ESTABLISHMENT OF THE BUREAU OF STATISTICS ON THE SUBJECT OF LABOR,
AND FOR OTHER PURPOSES.†

SECTION 1. *Be it enacted, etc.,* That the Governor be and is hereby authorized to appoint, on or before the first Monday in May next, and biennially thereafter, some suitable person to act as a chief of a bureau to be entitled a Bureau of Labor Statistics and of Agriculture, whose office shall be in the capitol building, at Harrisburg, and whose title shall be Commissioner of Labor Statistics and Agriculture, and who shall be confirmed by the senate.

SECTION 2. The duties of such officer shall be to collect, compile and systemize statistics, with reference to the subject of labor in its relations to the social, educational, industrial and general condition, wages and treatment of all classes of our working people, and how the same affect the permanent prosperity and productive industry of the commonwealth.

SECTION 3. It shall also be the duty of such bureau to collect, collate and classify statistics, relating to the mineral, manufacturing, agricultural and commercial productions of this commonwealth.

SECTION 4. The chief of said bureau shall report annually to the legislature, in convenient form, the result of his investigations, and shall receive for his services an annual compensation of two thousand dollars.

SECTION 5. That the chief of said bureau shall have power to appoint one clerk, whenever he shall deem such appointment necessary, at an annual salary of fourteen hundred dollars per annum, to be paid out of any moneys in the treasury not otherwise appropriated.

CONSTITUTION OF PENNSYLVANIA, ADOPTED DECEMBER 16, 1873, AND TO
TAKE EFFECT JANUARY 1, 1874.

Article IV.

SECTION 19. The Secretary of Internal Affairs shall exercise all the powers and perform all the duties of the Surveyor General, subject to such changes as shall be made by law. His department shall embrace a bureau of industrial statistics, and he shall discharge such duties relating to corporations, to the charitable institutions, the agriculture, manufacturing, mining, mineral, timber and other material or business interests of the state as may be prescribed law. He shall annually, and at such other times as may be required by law, make report to the general assembly.

* May 14, 1874, Pamphlet Laws 193, Purdon's Dig. 1529.

† April 12, 1872, Pamphlet Laws 59, Purdon's Dig. 80.

THE DUTIES OF THE SECRETARY OF INTERNAL AFFAIRS.*

SECTION 4. The Secretary of Internal Affairs shall exercise all the powers and perform all the duties which at the time of entering upon his office shall appertain to the Surveyor General. His department shall embrace a bureau of industrial statistics, the business of which shall be to impartially inquire into the relations of capital and labor, in their bearings upon the social, educational and industrial welfare of all classes of working people, and to offer practical suggestions for the improvement of the same.

The said bureau shall further collect, compile and publish such statistics in regard to the wages of labor and the social condition of the laboring classes as may enable the people of the state to judge how far legislation can be invoked to correct existing evils; and in order to facilitate the duties herein imposed, all corporations, firms or individuals engaged in mining, manufacturing or other business, and all persons working for wages within this commonwealth, are hereby required to furnish statistical information as the chief of said bureau may demand. The chief or duly authorized deputy shall have power to issue subpoenas, administer oaths and take testimony in all matters relating to the duties herein required of said bureau. Any corporation, firm or individual doing business within this commonwealth, who shall neglect or refuse, for thirty days, to answer questions by circular, or upon personal application, or who shall refuse to obey the subpoena and give testimony according to the provisions of this act, shall be liable to a penalty of one hundred dollars, to be collected by order of the commissioner of statistics, in an action of debt, in which the Commonwealth of Pennsylvania shall be plaintiff. This bureau shall also be required to collect, compile and publish annually the productive statistics of agriculture, mining, manufacturing, commercial and other business interests of the state; and the act of twelfth April, eighteen hundred and seventy-two, entitled "An act to provide for the establishment of a bureau of statistics on the subject of labor and for other purposes," is hereby repealed from and after the first Tuesday of May, one thousand eight hundred and seventy-five.

The Secretary of Internal Affairs shall discharge such duties relating to corporations, to the charitable institutions, the agricultural, manufacturing, mining, mineral, timber and other material or business interests of the state as may be prescribed by law. It shall be his especial duty to exercise a watchful supervision over the railroad, banking, mining, manufacturing and other business corporations of the state, and to see that they confine themselves strictly within their corporate limits; and in case any citizen or citizens shall charge, under oath, any corporation with transcending its corporate functions or infringing upon the rights

* May 11, 1874, Pamphlet Laws 135, Purdon's Dig. 1528.

of individual citizens, said secretary shall carefully investigate such charges, and may require from said corporation a special report, as enjoined in the constitution of the state; and in case he believes the charges are just, and the matter complained of is beyond the ordinary province of individual redress, he shall certify his opinion to the attorney of the state, whose duty it shall be, by an appropriate legal remedy, to redress the same by a proceeding in the courts, at the expense of the state: *Provided*, The Secretary of Internal Affairs may, with the approval of the Governor, appoint for four years from the first Tuesday of May, eighteen hundred and seventy-five, a chief of the bureau of industrial statistics, besides the other clerks of his office allowed by law, whose salary shall be twenty-five hundred dollars per annum.

APPROVED—May 11, 1874.

EXPENSES.*

SECTION 17. For the commissioner of bureau of statistics and agriculture, for salary, the sum of two thousand five hundred dollars; and for three clerks in the same, the sum of one thousand four hundred dollars each, the pay of these clerks to commence March first, one thousand eight hundred and seventy-three; for messenger therein two hundred dollars; for messenger, for services in same from January to June, one thousand eight hundred and seventy-three, one hundred dollars.

For stationery, two hundred and fifty dollars.

For traveling expenses, three hundred and fifty dollars, or so much thereof as may be necessary.

SECTION 18. For the payment of the contingent expenses of the bureau of statistics of labor and of agriculture, from the sixth day of May, Anno Domini one thousand eight hundred and seventy-two, to the first day of January, Anno Domini one thousand eight hundred and seventy-three, the sum of one thousand and fifty-three and thirty-four cents, on bills to be approved by the Auditor General and State Treasurer.

SALARIES.

The commissioner of bureau of statistics and the Surveyor General shall receive a salary of twenty-five hundred dollars.

In the bureau of statistics:

Three clerks, fourteen hundred dollars each.

One messenger, six hundred dollars.

All other allowances to said office to cease whenever said office shall be merged in the office of Internal Affairs.

In the bureau of statistics, until the same is merged, as aforesaid:

* April 9, 1873.

For postage, telegrams, express charges, traveling and miscellaneous expenses and cleaning offices, nine hundred dollars, or so much thereof as may be necessary.

THE STORAGE AND TRANSPORTATION BY PIPE LINES OF CRUDE AND PETROLEUM OIL, ETC.

SECTION 5. Every corporation, association, company, person or persons, who shall engage or continue in the business of transporting by pipe lines or storing of crude and refined petroleum, shall, on or before the fifteenth day of each month, cause to be made out and posted up in the business office of such corporation, association, company, person or persons, in an accessible and convenient place, for the examination thereof by any person desiring so to do, and shall keep so posted up, for one month, a statement signed by the manager, superintendent, general agent, agent or other person, having charge of the accounts of such corporation, association, company or person, and sworn to by such manager, superintendent, general agent, agent or other person, before some officer authorized by law to administer oaths, which statement shall show in a legible and intelligible form, the following details of the business of the previous month.

Fifth. Further, they shall on or before the twentieth days of January, April, July and October, in each year, transmit by mail to the bureau of industrial statistics at Harrisburg, the amount of petroleum transported or stored during the quarter preceding the first days of each of said months.

APPROVED—May 15, 1874.

(This act was repealed by an act approved May 22, 1878, which merely required that a monthly statement be posted in office.)

REPORTS AND CONTENTS.

SECTION 4. That the commissioner of statistics is hereby authorized to have five thousand copies of his annual report printed, and ready for distribution upon the meeting of the legislature in January, one thousand eight hundred and seventy-five, and to publish therein the fullest reports that can be procured from each county of the late triennial assessments, including the value of all property upon the assessors' books, and, so far as the same appears, the value of all real estate exempted from taxation, together with such matter as may be deemed proper, the reports to be distributed one-half to the House of Representatives, one-fourth to the Senate, and one-fourth to the departments.

APPROVED—June 5, 1874.

REPORTS.

SECTION 1. * * * Five thousand copies of the report of the bureau of industrial statistics, one thousand five hundred for the use of the Senate and three thousand five hundred for the use of the House of Representatives.

APPROVED—May 1, 1876.

STATE BOARD OF AGRICULTURE.

SECTION 1. That the Governor of the Commonwealth, the Secretary of Internal Affairs, the Auditor General, the President of the Pennsylvania State College, etc., shall constitute the state board of agriculture.

APPROVED—May 8, 1876.

REPORTS.

SECTION 1. Three thousand five hundred copies of the report of the bureau of industrial statistics, one thousand for the use of the Senate, two thousand five hundred for the use of the House of Representatives.

APPROVED—April 20, 1877.

REPORTS.

SECTION 1. Six thousand copies of the report of the bureau of industrial statistics, three thousand for the use of the Secretary of Internal Affairs for distribution to parties furnishing information and statistics from which said report is compiled, one thousand for the use of the Senate and two thousand for the use of the House.

APPROVED—May 3, 1878.

EXPENSES.

SECTION 6. For the payment of traveling and other incidental expenses for the collection of statistics by the industrial bureau, for each of the years commencing June first, Anno Domini one thousand eight hundred and eighty-one, and one thousand eight hundred and eighty-two, the sum of two thousand dollars, or so much thereof as may be necessary.

APPROVED—June 9, 1881.

COLLECTORS OF STATISTICS.

WHEREAS, Great difficulty has been experienced in the Bureau of Industrial Statistics of the Department of Internal Affairs, in securing

proper returns to circulars sent out for the purpose of gathering statistics;

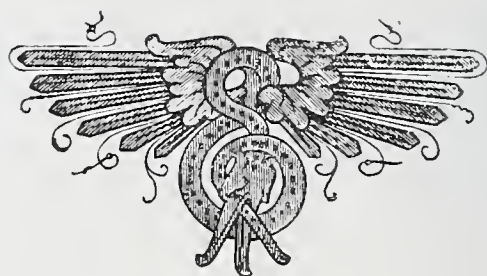
AND WHEREAS, It will be necessary to employ special agents, as is being done by other States, to travel throughout the Commonwealth, to gather reliable information in regard to the relations existing between the employer and the employed, as well as to secure valuable information regarding the manufacturing, agricultural and commercial interests of the Commonwealth; therefore,

SECTION 1. Be it enacted, etc., That the Secretary of Internal Affairs be, and he is hereby authorized and empowered to appoint two additional employes in said department, who shall be designated and known as collectors of statistics. It shall be the duty of said collectors of statistics, under the supervision of the Secretary of Internal Affairs, to visit the different industries of the Commonwealth, make careful and impartial inquiry into the relations existing between the employer and the employed, collect and compile statistics bearing on the social, educational and industrial condition of the laboring classes. It shall also be the duty of said collectors to gather and compile productive statistics on agriculture, mining, manufacturing, commercial and other business interests of the Commonwealth, and perform such other duties in connection with the Department of Internal Affairs, as may be required by the secretary thereof.

SECTION 2. That each of said collectors of statistics shall receive as compensation for such services, a salary of fifteen hundred dollars per annum, and shall, in addition thereto, be reimbursed for traveling and other incidental expenses, made necessary in the collection of statistics, which expenses shall be paid on vouchers, itemized and duly sworn to by said collectors of statistics, and certified to by the said secretary.

APPROVED—April 4, 1889.

REPORT OF THE FACTORY INSPECTOR.



REPORT.

FACTORY INSPECTOR'S DEPARTMENT,
HARRISBURG, PA., *January 26, 1893.*

To the Hon. ALBERT S. BOLLES, *Chief of the Bureau of Industrial Statistics, Harrisburg, Pa :*

DEAR SIR: In accordance with section five, of the act regulating the employment of women and children, approved May 20, 1889, I have the honor to submit my report for the year ending November 30, 1892.

There having been no legislative changes since my last report, I can only reiterate my recommendations as made a year ago, as a whole, and thereby obviate the necessity of a wholesale repetition of what I then recommended ; indeed, there can be very little excuse for making additional recommendations until those already made shall have met with favorable consideration of the honorable bodies, the State Senate and the House of Representatives, and finally the approval of His Excellency the Governor of the Commonwealth.

I have not made any changes in the department during the year, owing to the lack of funds to carry on the work in a more extended manner than at present.

Miss Mary O'Reilly, whose territory as a deputy is confined to Philadelphia, Chester and Montgomery counties, devoted two months of this year to the counties west of the Alleghenies, and accomplished very much good, but for lack of funds, I was unable to longer continue her services, and, of course, placed her again in her own district.

M. N. Baker, deputy of the western section of the state, was called out as a member of the National Guard of Pennsylvania early in July of this year to do military duty at Homestead, Pa., and was detained there for more than two months ; with this exception the whole force has been constantly on duty in the Factory Inspector's Department.

The work of the department is becoming more practical, aided by the experience of the three years' work which have now been performed, and I may, without egotism, say that during the year and a half which I have had the honor to be at the head of this department, results have

fully justified my claim to having improved its usefulness. However, this has not been done without a great deal of trouble, and I may say painful work.

There are two classes which make claims upon the department, the employer and the employe, the former for clemency, and the latter for protection, and so frequently do these opposite appeals come from people who are related to each other as employer and employe, that it requires a great deal of patience and perseverance on the part of the whole department to carry into effect the requirements of the act. It not infrequently happens that some outraged man or woman, boy or girl, will write to me and urge that this or that evil be remedied at the place of his or her employment, and it quite frequently happens that these places may not be under our jurisdiction, owing to the operation of section four of the law governing the department and in the cases where we have jurisdiction, it is sometimes difficult to locate the trouble without throwing suspicion on the writer of the letters referred to, making it necessary to visit and re-visit one establishment many times before the unlawful practices can be fully proved.

It has been my aim to effect the changes necessary without appealing to the courts of justice for a remedy, and it is with pleasure that I can report much success on this line: but there have been instances where it has failed, and in every such instance I have caused warrants to be issued for the arrest of the violators of the law in accordance with my sworn obligation and duty.

Manufacturers have complained that I have been unduly severe; their employes have quite as bitterly complained that I have been too lenient and derelict, the latter charge usually being made by labor unions and forwarded to me in the shape of a set of resolutions. I may say without fear of successful contradiction, however, that neither the complaint of the employes nor the strictures of the manufacturers have for one moment influenced the department, or caused the slightest deviation from the strict path of duty.

In my last report I stated that in the case of Hugh French, of Philadelphia, *Cotton Waste Manufacturer v. The Commonwealth*, was yet undecided, owing to its not being called up by the proper authorities in Philadelphia county, but that I would state in my next report how the case had resulted, anticipating that it would shortly be called for trial. However, months passed by, and no evidence of its being called was manifest, and being anxious to have it determined so as to report on it at this time, I wrote to the district attorney, Hon. G. S. Graham, of Philadelphia county, on October 10, 1892, requesting him to inform me when the charges made by my department would be tried, as they had already been in his hands ranging from eight months to one year. He replied by asking what cases I referred to, but before I could give him this information the cases were called and disposed of as follows:

Mr. French was acquitted on the ground that he as owner of the building where the unlawfulness charged against him was prevalent, was not amenable, but that his tenants were. His honor Judge Fell decided the case as above stated. Prior to the trial Mr. French admitted the truth of the allegations made by the Factory department, but made the plea that his tenants were the proper parties to make such repairs as would place the factory in a condition required by the Factory Inspector. The witnesses being all poor working people were allowed fees by His Honor Judge Fell. In the meantime the tenants have carried out the orders issued by the department, and the place is now very satisfactorily conducted.

On February 18, it became my duty to order the arrest of Samuel Horner, carpet manufacturer, Philadelphia, for violation of section two of the factory act; also Stinson Brothers, but it was with great difficulty that we were enable to succeed in having them arrested. Lieutenant Scott, in whose police district the parties referred to resided, positively declined to serve the warrants, and in answer to Miss O'Reilly's question as to why the arrests were not made, he said he dare not as Superintendent Linden, had forbidden him to serve the warrants. I at once called upon Superintendent Linden and requested him to state upon what ground he declined to serve the warrants issued at the instance of the Factory department, to which he replied, "I have nothing to say, except that I have superiors." "Who are your superiors?" I then asked, and he replied, "His Honor Mayor Stuart and Director Beitler." I at once called on the latter and asked for an explanation, and he said "Mr. Stinson was very ill in bed, and on the strength of his physician's written statement to that effect I ordered the warrants to be withheld for the time being." I at once coincided with his expressed views in this instance but asked, "Why has Mr. Horner not been arrested?" He said I know nothing about it, but I will call Superintendent Linden. The superintendent was called and the director asked him why he had not arrested Samuel Horner, to which the superintendent replied, "Because you ordered me to act otherwise." "This is a mistake, I gave no such order," said the director, "and I want Lieutenant Scott to proceed at once to Mr. Horner's place of business, place him under arrest, and bring him here for an immediate hearing." He next called for Magistrate Clements and requested him to hold an afternoon session of court in order to give Mr. Horner a hearing. The hearing was held Saturday, February 20, 1892, and was postponed until Wednesday, the 23d of February, at which time Mr. Horner gave bail in six hundred dollars for appearance at court.

At the court trial on October 18, 1892, Mr. Horner pleaded guilty and was dismissed by His Honor, Judge Fell, on the ground that it was his first offense and that he had not really intended to disregard the law. Mr. Horner defrayed witnesses' costs, as the accompanying correspondence will show:

PHILADELPHIA, *October 18, 1892.*Mr. ROBERT WATCHORN, *Chief Factory Inspector, Harrisburg, Pa.:*

DEAR SIR: I have been expecting a visit from you before now, and have therefore not forwarded any information regarding the cases recently brought up. I have received in each case a letter acknowledging the violation of the law, and a promise to strictly comply with the same in the future. This morning the Horner case was called for trial before Judge Fell. I was present and assisted Mr. Boyle, the assistant district attorney, in the trial of the case. Mr. Horner pleaded guilty in open court, and assured the court that the law would be hereafter strictly enforced. Miss O'Reilly was called to the stand, and stated the facts of the case, after which Judge Fell suspended sentence, and discharged Mr. Horner, saying that in view of the plea of guilty it was not worth while imposing any penalty. I think myself this is a substantial victory for the department, in view of the fact that Mr. Horner is one of the largest manufacturers of his class in our county, and with the record of guilt by his own confession, against him, I do not think there need be any fear of any violation of the law hereafter. Shortly after this case was disposed of, the case of French was called. The evidence as disclosed by the defense, and which we were not able to contradict, showed that French merely occupied a room in the building for office purposes, and did not have any one employed under him. That as to the rest of the building, it was all sub-let to various tenants. In view of these facts, the defense was set up that he was not liable, not being in possession of the premises at the time; that instead of arresting him the tenants were the parties responsible. After argument by myself for the Commonwealth, and by Mr. Gorman for the defendant, the court charged the jury that Mr. French was not guilty of the charge and that the jury should find in his favor on the ground as laid down in their defense, as above cited. I think this is good law and ought to govern the department in the future.

Yours respectfully,

F. A. HARTRANFT,
Attorney-at-Law.

PHILADELPHIA, PA., November 10, 1892.

COMMONWEALTH }
v. } Charged with violating factory law.
HORNER. }

DEAR JUDGE: The following witnesses were subpoenaed and were important witnesses in above case on behalf of the Commonwealth:

Emma Malpas,	2 days.	Anna Woolen,	2 days.
Lena Pah,	3 days.	Florence Kitchenman, . . .	1 day.
Lizzie McVey,	3 days.	Mary T. Caffrey,	1 day.
Linda Whitfield,	3 days.	Emma Bush,	2 days.
Maggie McNair,	2 days.	Mary McDonald,	2 days.
Emma Baker,	2 days.	Rose Carter,	1 day.
Clara Duffield,	2 days.	Sadie Campbell,	1 day.
Lillie Ruskin,	2 days.		—
Total, \$43.50, one dollar and fifty		Total,	29 days.
per day.			

F. A. HARTRANFT,
Attorney for Factory Department.

“PHILADELPHIA, November 11, 1892.

MR. ROBERT WATCHORN:

DEAR SIR: Judge Fell yesterday sent for me and handed me a general release signed by the children in the Horner case. He told me that he had sent for Mr. McCarthy and told him that Mr. Horner ought to pay the witness fees; that had it occurred to him at the time he would have imposed it at the trial. Mr. McCarthy promised to bring in the money so that the witness fees might be paid in accordance with the list that I furnished the judge, which is also herewith enclosed. Instead of doing as he had promised, Mr. McCarthy presented the release. So far as we are concerned it answers our purpose for I presume that Horner paid the children instead of sending money to us. At any rate if there should be any claim made that these fees were not paid, you have this release as your answer.

Yours very truly,
F. A. HARTRANT,
Attorney at Law.”

PHILADELPHIA, PA., November 15, 1892.

We, the undersigned, hereby waive all claims to any fees against the Commonwealth as witnesses in the case of the Commonwealth against Samuel Horner, Jr., charged with violating the factory law:

Lizzie McVey,
Mamie Stewart,
Linda Whitfield,
Lena Pah,
Emma Bush,
Lillie Bushton,
Emily Malpas,
Mary McDonald,
Sadie Campbell,

Clara Duffield.
Katie Lally,
Florence Kitchenman,
Mamie Craig,
Anna Woolen,
Maggie McNair,
Mary T. Caffrey,
Rose Carter.

The Stinson case was dismissed by Magistrate Pole on March 30, because there was not proof enough to convict the accused of violating the law, *subsequent to the serving of the warrant* (although there was unquestioned proof of minors working seventy and one-half hours per week), and taking that as an evidence that the firm would observe the law in the future, the case was dismissed.

It was apparent to me that the practice of employing minors over sixty hours per week, with which we charged them, would be discontinued and the case was allowed to pass over; since which time we have had no cause for complaint with the Stinson brothers.

During the latter part of March we were daily in receipt of remonstrances from the employes of Wm. Ayers & Sons, of Philadelphia, against being compelled to work overtime, and having fully satisfied myself that the complaints were just, I at once took steps to check the evil of which they complained, but as it was by no means an easy task to find competent witnesses to sustain the charge of violation, we, therefore, waited until the end of the week when we found the mill in full operation, with boys and girls working in some instances for seventy hours, this being ten hours in excess of the lawful time. We applied for a warrant for the arrest of Mr. Ayers and subpoenaed the children who had been compelled to work this overtime and the case was called before Magistrate McCarthy on April 1, 1892, when it was postponed until April 2, at which time the children who were present as witnesses, testified positively that they had been compelled to work more than sixty hours per week. Deputy Inspector Miss O'Reilly testified to having found the children on the premises after night, yet Magistrate McCarthy peremptorily discharged the defendant (saying as he did so), "I find no evidence against you Mr. Ayers; you are discharged and the case dismissed." So palpable and glaring did this injustice appear to me that I at once instructed my attorney to take an appeal from the magistrate's ruling which was done, but I am unable to report fully on the case at this time, because it has not yet been further acted upon,

but I intend to keep it from "going to sleep" if I possibly can, and shall in my next report, deal with it more thoroughly.

On March 22 a petition from Mahanoy City was forwarded to me which, coupled with the desire of several hundred miners and mine laborers, caused me to proceed to Mahanoy City, and in accordance with the semi-monthly pay law, commenced proceedings against Messrs. Lentz, Lilly & Co., miners and shippers of coal, for violating the provisions of said semi-monthly pay law. The following petition, signed by 150 trades-people and merchants, will indicate the intensity of public sentiment on this matter.

"To ROBERT WATCHORN, *Factory Inspector, Harrisburg, Pa.* :

DEAR SIR: We, the citizens and business men of Mahanoy City, Pa., in compliance with the power vested in us as citizens by the amendment to the act of assembly, relating to the semi-monthly payment of wage-workers, said amendment being approved the 20th day of May, A. D. 1891, do petition you to comply with said act, and appear here against the following companies: Lentz, Lilly & Reilly, of Park Place, Schuylkill county; Mill Creek Coal Company, of New Boston and Buck Mountain, Schuylkill county, Pa., and Dodson Coal Company, Morea, Schuylkill county, Pa., for having openly violated said act by refusing to pay their wage-workers for work done from February 1 to 15, 1892, between February 15 and March 1, 1892, as is required by said act, and when demanded by said wage-workers.

"Since the said companies are always anxious in time of any of their troubles to invoke the aid of the law to protect their rights, we submit that you, in your official capacity, will now protect the wage-worker and the community in general in their rights.

Respectfully yours, etc."

The workmen involved, several hundred in number, met me at the office of Justice of the Peace Coyle, and furnished me such evidence, including due bills showing that all wages were deducted at the store, as to leave me no alternative but to prosecute, which I did. Shortly afterwards I received the following letter from the legal representative of Messrs. Lentz, Lilly & Co.

"ASHLAND, PA., *March 24, 1892.*

MR. ROBERT WATCHORN, *Factory Inspector, Harrisburg, Pa.* :

DEAR SIR: Your deputy from Scranton brought a prosecution against Lentz, Lilly & Co., of Park Place, for refusing to pay semi-monthly. There seems to be some disagreement amongst the members of the firm as to the propriety of the step, and they now propose to make semi-monthly pays, and ask that the prosecution will be discontinued. Doubtless your deputy has written you, and as the law seems to be more for the enforcement of the semi-monthly pays than the purpose of punishment, you will probably feel that that part of the prosecution is gained by the resumption of the semi-monthly pays. Will you please write me at an early day your conclusions, and if you see fit to order the prosecution to be withdrawn, please instruct your deputy at Scranton. Awaiting your reply,

I remain very truly yours,

W. A. MARR."

To which I replied as follows:

"HARRISBURG, *March 29, 1892.*

W. A. MARR, Esq., *Attorney-at-Law, Ashland, Pa.:*

DEAR SIR: Replying to your favor of the 24th inst., I would like to ascertain if your clients, Messrs. Lentz, Lilly & Co., have already complied with the semi-monthly pay law, and if not, what evidence do they intend to give that they will do so. As far as I am concerned all I desire is compliance with the semi-monthly pay law, and I have no doubt but my petitioners will cheerfully accept the fruits of said law without litigation. Let me hear from you on the points above referred to in order that I may be able to take the proper course in the matter.

Very truly yours,

ROBERT WATCHORN,
Factory Inspector."

"ASHLAND, PA. *April 2, 1892.*

MR. ROBERT WATCHORN, *Harrisburg, Pa.:*

DEAR SIR: In reference to your recent letter I enclose you letter of Messrs. Lentz, Lilly & Co., and if satisfactory will you please instruct your deputy to withdraw prosecution, and will you also send me a letter at an early day advising me if same has been done.

Very truly yours,

W. A. MARR,
Attorney-at-Law."

"PARK PLACE, SCHUYLKILL COUNTY, PA., *March 31, 1892.*

W. A. MARR, Esq., *Ashland, Pa.:*

DEAR SIR: Your letter of yesterday inclosing one from Inspector Watchorn received. We paid our employes to day for the first two weeks of March and expect to continue paying semi-monthly until the semi-monthly pay law is repealed. It is our desire that Mr. Watchorn withdraw the suit and that all litigation shall cease.

Yours truly,

LENTZ, LILLY & Co."

"HARRISBURG, *April 7, 1892.*

W. A. MARR, Esq., *Ashland, Pa.:*

DEAR SIR: Replying to your favor of recent date I beg to state that I have written Deputy B. T. Castles to withdraw the suit against your clients on the strength of their letter to you. I trust the promise they have made will be faithfully kept so as to render it unnecessary for this department to take any further action in the matter.

Very sincerely yours,

ROBERT WATCHORN."

The foregoing correspondence indicates that the case was withdrawn, since which time there have been no further complaints from that place.

A similar settlement was made between this department and the Morea Coal Company, near Mahanoy City, Schuylkill county, Pa.

There are many manufacturers who mislead this department in its search for information, and although we have doubled our diligence we have found great help from the volunteered information of factory employes; and while it is not my intention to make up my report with the

great number of these letters, I do feel that I ought to give one or two as a sample of the many which we are constantly receiving, and I believe it can be fairly taken as a very good sign when the poor toilers all over the state feel confidence enough in the Factory Inspector's Department to write in confidence about the disadvantages under which they are compelled to labor.

The following letters are given as samples, the names being withheld for obvious reasons:

“PHILADELPHIA, PA.

Mr. ROBERT WATCHORN, *Harrisburg, Pa.*:

“DEAR SIR: It was with pleasure I read an abridged account of your report to the Chief of the Bureau of Industrial Statistics. But what I appreciate is your recommendations, and as a factory worker allow me to congratulate you upon the wise step you have taken in that direction. Your recommendations in section one are good and are of a progressive nature, but I would rather if it had read that no female or minor shall be employed for a longer period than ten hours per day or sixty hours per week; for so long as females are not distinctly specified the manufacturers will just continue as at present, that is to work until 8 or 9 o'clock at night, therefore subjecting us to work seventy in place of sixty hours per week, and as you know just as well as I do that in this age of industrial activity it is beyond the endurance of either male or female to stand these hours without in some way affecting their vital organism. I am very well aware that it will be very difficult for even the amendments you propose to become law by the sort of legislators that are sent to Harrisburg. At the same time I believe that overtime is one of the greatest curses the factory workers are subjected to. I may state here that there is at the present time two factories in this ward running overtime, one until 8 and the other to 9 p. m. The one is ———, the other is ———, and both places are violating section one of the factory act, as they have girls under age working seventy hours per week. ——— works his employes from noon until 8 p. m. without intermission, and even does not allow them to have their suppers brought to them.

Yours respectfully.”

“BLOOMSBURG, July 19, 1892.

Mr. WATCHORN, *Harrisburg, Pa.*:

“DEAR SIR: I desire to tell you about ———. I heard there was a fine for working their hands overtime. They work from ten to twelve hours, and it is too hard for any child to work. If they don't work they discharge them. If there is any way to stop it please let me know by return mail. It ought to be stopped. I was sick the other night and they discharged me because I could not work overtime. If I can make them pay for it I will do so.

Respectfully yours.”

The letters resulted in a closer watch being kept on the mills in question.

Last August the firm of Caswell and Staver were found to be working overtime, and Deputy Inspector Castles made a complaint against them, which was to have been tried the month following, but as will be seen by the following correspondence the case was discontinued, the firm giving positive assurance that they will hereafter observe the factory law.

“BLOOMSBURG, September 20, 1892.

ROBERT WATCHORN, Esq., *Harrisburg, Pa.*:

“DEAR SIR: I have subpoenaed witnesses to appear Tuesday the 27th inst., at 1 p. m., in Case *v.* Caswell and Staver, for violating the factory law. Parties are desirous of settling so as to avoid stopping mill and public matter, and want to know if same can be done. Please be on hand Monday evening or Tuesday morning.

Yours, etc.,

WM. CHRISMAN,
District Attorney.”

“HARRISBURG, September 23, 1892.

WM. CHRISMAN, Esq., *Bloomsburg, Pa.*:

“DEAR SIR: Replying to your favor of the 20th inst., I desire to say that I have no malicious desire to prosecute Messrs. Caswell and Staver for violating factory laws; my sole aim is to have said laws rigidly enforced, where they are not otherwise cheerfully observed, and in conformity with your question as to whether the request of Messrs. Caswell and Staver for a withdrawal of the charges can be granted, I beg to make the following suggestion: That this being the first offense (as far as I know) of the parties hereinbefore mentioned, and not desiring to unnecessarily punish by having them convicted of a misdemeanor, I will withdraw the proceedings (by your permission) on the following conditions: First, that Messrs. Caswell and Staver pay all costs in the case. Second, that not later than Saturday of this week that they will jointly sign over their own autograph signatures in a note addressed to me as Factory Inspector, that they will hereafter observe the factory law willingly.

If they sign this paper you can send by special delivery letter to me and I shall receive it at Harrisburg on Monday morning, and I will then advise the withdrawal of the suit. Otherwise it must go on.

I am compelled to take this course because of the proneness of manufacturers to forget that offenses have been condoned and even to deny that they were ever guilty of violation of the law, and in such cases the embarrassments of my department increase rather than diminish. In short I want a *bona fide* statement from the defendants in this case that will assure me that they are in earnest and sincere in their efforts to get the case withdrawn.

I shall instruct Mr. Castles to proceed at once to Bloomsburg and if the case is to be called I desire that you call it so as to give me time to arrive after Mr. Castles telegraphs me to come.

Sincerely yours,
ROBERT WATCHORN.”

"HARRISBURG, *September 23, 1892.*

B. T. CASTLES, Esq., *Scranton, Pa. :*

DEAR SIR: Please proceed to Bloomsburg at once or at such time as will enable you to arrive there by Monday noon or not later, and wire me from that point if Messrs. Caswell and Staver have accepted my term of settlement. The district attorney will make known the terms to you which are briefly, that defendants pay all costs and personally acknowledge by letter to me that they violated the law, and will observe it hereafter. If they don't agree to this let the case go on; wire me Monday as early as you can whether they comply and I will come to you if they don't.

Remember I shall look for a telegram on Monday announcing the result.

Sincerely yours,
ROBERT WATCHORN."

"BLOOMSBURG, PA., *September 24, 1892.*

ROBERT WATCHORN, Esq.,

DEAR SIR: Your letter of the 23d inst., received relative to prosecution against Caswell and Staver. I enclose agreement signed by them and will have costs paid before *nol. pros.* is entered.

Yours, etc.,
WM. CRISMAN,
Attorney at-Law."

"BLOOMSBURG, PA., *September 24, 1892.*

HON. ROBERT WATCHORN, *Chief Inspector, Factory Department,*
HARRISBURG, PA.,

DEAR SIR: Wm. Chrisman, Esq., district attorney, having informed us that you are willing to withdraw proceedings instituted against us, charging a violation of the factory law, upon our paying the costs, and saying over our signatures to you that we will hereafter observe the factory law willingly, we do not hesitate to say: That we will so observe the factory law.

In saying this, however, as we believe your action was taken by you wholly in good faith, we feel that we would do injustice, as well toward you as ourselves, if we did not say, also that we have heretofore endeavored to observe the law, and that we feel confident that an explanation of our work and course of business would cause you to accord with us in the opinion that we have not been guilty of a violation of the conditions of the law.

We will arrange costs with the district attorney. Recognizing your proper exercise of judgment, and also your kindness in permitting us to avoid both annoyance and notoriety in this case, we are

Very truly yours,
E. C. CASWELL,
J. M. STAYER."

"BLOOMSBURG, PA., *September 27, 1892.*

HON. ROBERT WATCHORN, *Chief Inspector, Factory Department, Harrisburg, Pa. :*

DEAR SIR: Having had some conference with Mr. Castles, deputy inspector and being informed that our letter to you of 24th inst., may not

be satisfactory to you in that it does not admit of any violation of the law, we wish to say that we do not deny but that there have been instances of overwork by employes in our business.

In fact we admit that. But we wish to have you understand in our expression that we believe our course of business would satisfy you that we have not been guilty of a violation of the conditions of the law; that we had a sufficient excuse for such overwork under the provisions of the act as to making necessary repairs.

Very respectfully yours,

E. C. CASWELL,
J. M. STAVER."

To my knowledge we have had no cause to regret the withdrawal of this case, everything now being reported in proper condition.

During the month of September we were constantly in receipt of letters and resolutions from employes and labor unions setting forth that a certain number of factories were constantly violating the law by working overtime. It was well known to us that such was the case, but the peculiarity of cases prevented us from proving violation of the law, for many employers have adopted the relay system, or in other words, they work two sets of minors. When one lot have made their sixty hours, they are then dismissed for the week, and a new lot are taken on to do the work, while the adults, men and women alike, are continued at work overtime, and so while many citizens censure this department for permitting overtime they are quite unaware of the fact that we are powerless to act in many cases for the reasons just given. However, during the latter part of September I called to my assistance Deputies O'Reilly and Mrs. McEnery, and we made a thorough canvas of the entire mills included in the lists furnished us by the various complainants which resulted in the issuing of warrants for the following persons:

E. H. Godshalk & Co., Edward H. Godshalk, president, 23d and Hamilton streets. Violating section 1.—Overtime. Dep. F. Ins., Belle McEnery, 2244 Van Pelt street. Visit Sept. 14th.

Hensel-Colladay Co., George L. Hensel, president, 51 N. 7th street. Violating section 1.—About 30 overtime. Violating section 2.—About 6, no affidavits. Visit Sept. 14th.

Kaufman Bro. & Co., 401 Race street, Abraham and William Kaufman, Sylvester C. Klopfer and Isaac Goodman. Violating section 1 and 3. Visit Sept. 13th.

M. W. Lipper & Co., 317 Garden street, Moses W. Lipper, Joseph Loeb, James S. Ellison and Henry M. Lipper, Jr., trading as M. W. Lipper & Co. Violating section 1 and 2. Visit Sept. 12th.

Ziegler Bros. Violating section 2. Visit Sept. 27th.

COMMONWEALTH OF PENNSYLVANIA, } ss:
COUNTY OF PHILADELPHIA, }

Belle McEnery, being duly sworn, deposes and says that she is a Factory Inspector for the Commonwealth of Pennsylvania. That from a personal inspection of the factory premises, situate at 23d and Hamilton streets, Philadelphia, and operated by The E. H. Godshalk Company, Edward H. Godshalk, president, made by deponent on September 14, 1892, she found that said company was then, and had been for some time previous thereto, employing minors at labor for a longer period than sixty (60) hours per week, in violation of the first section of the act of assembly, entitled "An act to regulate the employment, and provide for the safety of women and children in mercantile industries and manufacturing establishments, etc.," approved the 20th day of May, A. D. 1889.

And further deponent saith not.

Sworn and subscribed to before me, this day . of . . . , A. D. 1892.

BELLE MCENERY.

E. H. GODSHALK & Co., COR. 23D AND HAMILTON STS., PHILA.

Names, residences and ages of certain minors employed in upholstery goods factory of E. H. Godshalk & Co.; also the number of hours worked per week.

Maggie Bilger, 3905 Nice street, aged 15 years. Time worked per week 70 hours.

Mary Brandt, 925 York street, aged 17 years Time worked per week 70 hours.

Celia Donevan, 2336 Virginia Ave., aged 16 years. Time worked per week 70 hours.

John Strout, 418 rear of S. 25th street, aged 14 years. Time worked per week 70 hours.

Neil Dever, 2431 Wash. Ave., age 15 years. Time worked per week 70 hours.

Jos. Brown, 420 N. 23d street, age 15 years. Has worked overtime for four or five weeks.

COMMONWEALTH OF PENNSYLVANIA, } ss:
COUNTY OF PHILADELPHIA, }

Belle McEnery, being duly sworn, deposes and says that she is a Factory Inspector for the Commonwealth of Pennsylvania. That from a personal inspection of the factory premises, situate at 24th and Hamilton streets, and No. 51 North 7th street, Philadelphia, and operated by the Hensel-Colladay Company, George L. Hensel, president, made by deponent on September 14, 1892, she found that said company was then, and had been for some time previous thereto, employing minors at labor for a longer period than sixty (60) hours per week, and also em-

ploying children under the age of 16 years without requiring the production of an affidavit of the age, date and place of birth of said children, and without having such affidavit on file, in violation of the first and second sections of the act of assembly, entitled "An act to regulate the employment and provide for the safety of women and children in mercantile industries and manufacturing establishments, etc.," approved the 20th day of May, A. D. 1889.

And further deponent saith not.

Sworn and subscribed before me this . . . day of . . . , A. D. 1892.

BELLE McENERY.

HENSEL-COLLADAY COMPANY, TRIMMINGS, 51 NORTH SEVENTH STREET.

Mamie Forster, 425 Bell road, 14, no certificate, 6 to 8 all last week.

Annie Tomlinson, 714 Sterling street, 14, 6 to 8 all last week, Saturday, 4.

Annie Waltple, 341 South street, 15 in 3 months, 7 to 3 all last week, Saturday, 4.

Gertie Painter, 1725 Fairmount avenue, 6 to 8 all last week.

Mary Ward, 1333 South Twenty-first street, 15, all last week, 4 on Saturday.

Nellie Lukens, 5919 Tulip street, Wissinoming, 15, no certificate, 6 to 7 all last week.

Tillie Warner, 1039 Field street corner McKean, 20, 6 to 8 all last week.

Mamie Adams, 1131 Wisner street, 14, full time, 8 p. m.

Mary Quibeck, 730 Brook street, 14, full time, 8 p. m.

Clara Harth, 1512 Sanderson street.

Annie Leffert, southwest corner Otsego and Dudley streets, 16, 7 p. m.

Jennie Scott, 5921 Tulip street, Wissinoming, every night till 7 p. m.

Mary Carberry, 2025 Hampton corner Pine, 12, no certificate, 6 weeks, every night but one. Saturday 4.

Annie Silvey, 809 Earp street above Reed, 17, all week, every night.

Bessie Cohen, 1044 South Fifth street, full time, 6 to 8.

Mary Hopkins, 1838 Palace street, 16, full time, 6 to 8.

Thomas Hoffner, 2304 O'Neil street, 14, no certificate.

Ella Walters, 126 Clinton street, Camden, 16, full time.

Martha Hoppy, 1027 Charlotte street, 12, 70 hours 50 minutes.

Madelina Smith, 1127 Charlotte street, 15, 70 hours 50 minutes.

Mary Hoppy, 13, 70 hours 50 minutes.

Amelia Kiefner, 443 Belrose street, 15, full time.

Katie Michonski, 612 Front street, 15, full time.

Katie Sodusky, 913 South Front street, 14.

Joseph McCann, 856 McGrath street, 18, full time

Gussie Oswald, 2656 Jasper street, 16, full time.

Nellie Meating, 104 Stamper street, 1 day off.
 Annie Walsh, 1120 Wisner street.
 Lizzie Read, 1130 Wisner street, 15, 25th July.
 S. Suntsen, 16 years, 16th August.
 Ernestine Widemann, 1504 North Fifth street, 15 years, 4 weeks over-time.
 Julia Koejler, 714 Noble street, 21.
 Mary Redmand, 1033 Ternon street, 21.
 John N. Poyet, 727 Federal street.
 Annie Hughes, 116 Wood street, 15 next June.
 Jennie Roar, 901 Hoffman street, 17.
 Lizze Hopkins, 1838 Palace street, 19.
 Esther Redmond, 1320 Kater street, 17, 63 hours.
 Clara McNeice, 2129 Tasker street.
 Daniel Kane, 1831 North street, 13, no certificate, employed 3 months.

HENSEL-COLLADY COMPANY, TRIMMINGS, BRANCH TWENTY-FOURTH AND
 HAMILTON STREETS.

Lizzie Donovan, 2336 Virginia avenue, 15, 70 hours.
 Nellie Regan, 15, no certificate, 68 hours, employed 5 months.
 Maggie Dougherty, 418 Caven street, 14, no certificate, employed since the last of July.
 Thomas Hoffner, 2304 Owen street, 14, no certificate.
 Maggie Shields, 24th and Washington avenue, 14, no certificate.

COMMONWEALTH OF PENNSYLVANIA, } ss.:
 COUNTY OF PHILADELPHIA.

Belle McEnery, being duly sworn, deposes and says, that she is a Factory Inspector for the Commonwealth of Pennsylvania. That from a personal inspection of the factory premises, situate at No. 401 Race street, Philadelphia, and operated by Abraham and William Kaufman, Sylvester C. Klover and Isaac Goodman, trading as Kaufman Bros. & Co., made by deponent on September 9, 1892, she found that said company was then, and has been for some time previous thereto, employing minors at labor for a longer period than sixty (60) hours per week, and also employing children under the age of sixteen (16) years, without having a list of said employes posted in the rooms where employed, in violation of the first and third sections of the act of assembly, entitled "An act to regulate the employment and provide for the safety of women and children in merchantile industries and manufacturing establishments, etc.," approved the 20th day of May, A. D. 1892.

And further deponent saith not.

Sworn and subscribed to before me, this , day of , A. D. 1892.

BELLE MCENERY.

KAUFMAN BRO. & CO., 401 RACE STREET, PHILADELPHIA.

Names, residences and ages of certain minors employed in factory of Kaufman Bro & Co.; also the number of hours worked per week.

Katie O'Neill, 17 in March, 929 Carpenter street, 5 days, 50 and 8 (Saturday), 58 and $12\frac{1}{2}$, full time and $10\frac{1}{2}$ extra.

Annie King, 18 in October, 129 Morris street, 58 and $12\frac{1}{2}$, $10\frac{1}{2}$ extra.

Ada Stone, 18 in May, 414 Walnut street, Camden, N. J., 58 and $12\frac{1}{2}$, $10\frac{1}{2}$ extra.

Grace Moore, 18 in March, 1845 South street. Lost $\frac{1}{2}$ day Monday, 55 and $12=67$, $10\frac{1}{2}$ extra.

Francis Rahubinski, past 16, corner Swanson and Crean streets (Front and Spruce), 50 and 12 and $8=70$, 10 hours.

Mary Bleffs, 18, East Seventh street, 50 and 12 and $8=70$, 10 hours. Claim average of 5 hours extra.

Harris Ellis, 1816 Bond street. (Full time) $60\frac{1}{2}+12=72\frac{1}{2}$, 12 hours extra, 4 nights.

Wm. Weisser, 1806 North Fifth street. (Lost Monday) $42\frac{1}{2}+12+8=62\frac{1}{2}$, $2\frac{1}{2}$ extra, (4 nights).

Wm. Kee, 529 Vine street, $60\frac{1}{2}+9=69\frac{1}{2}$. $9\frac{1}{2}$ hours extra.

Geo. Bowers, 2433 Christian street, 3 nights, 3 hours each, $60\frac{1}{2}+9=69\frac{1}{2}$, $9\frac{1}{2}$ extra

John Morrison, 690 Van Hook, Camden, N. J. $47+8+9=64$, 4 hours extra (3 nights).

Chas. Rainier, 556 Division, Camden, N. J. $52\frac{1}{2}+12=64\frac{1}{2}$, $4\frac{1}{2}$ hours extra.

Chas. Bastian, Fifteenth and Passyunk avenue, $49\frac{1}{2}+6=55\frac{1}{2}$, 2 nights.

M. W. LIPPER NOVELTY CLOAK COMPANY AND KEYSTONE BRAID WORKS.

Violating sections one and two.

Names, residences and ages of certain minors employed in works of M. W. Lipper & Co.; also the number of hours worked per week.

No certificate.

Mamie Horan, 15 years, 1733 Pearl street, full time and five nights until 7 p. m.

Mary Hanson, 113 Senate street, 15 years, ditto.

Jamie South, 2040 Titan street, 17 years, ditto.

Mamie McCrossin, 17 years, 335 North Thirteenth street, ditto.

Annie Smith, 16 years, 1727 Pearl street, ditto.

Lilly Nagleberg, 714 Marshall street, 16, ditto.

Louisa Fendins, 447 Fairmount avenue, 17 years full time, 4 extra hours.

Annie Fink, 17 years, 413 Buttonwood street, 65 hours.

Alice Schwartz, 16 years, 619 Watkins street, 65 hours.

Bertha Kuser, 16 years, 805 Vine street, 65 hours.
Rosa Freedman, 16 years, 210 Canal street, 65 hours.
Lizzie Arenedt, 18 years, 1203 Federal street, 65 hours.
Sally Jaep, 541 Wilder street, 15 years, 64 hours.
Annie Jacobs, 16 years, 817 Weccaco street, 65 hours.
Sadie McNally, 19 years, 2547 Ellsworth street, 65 hours.
Rose Marsoosky, 15 years, Second and South, 65 hours.
Maggie Barrett, 1732 Wood street, 16 years, 63 hours.
Annie MacCusker, 710 Jamison street, 13 years, one week, without certificate.

Annie Dobson, 17 years, 115 North Abbion street, 64 hours.
Annie Crowmiller, 14 years, 1317 Atmore, no certificate, 64 hours.
Michael Targman, 20 years, 407 York avenue, 65 hours.
Robert Pollock, 14 years, No. 1 Boyds avenue, no certificate; 2 hours overtime, but lost a day.
Harry Targman, 18 years, 407 York avenue, 62 hours.
Jacob Smallock, 15 years, 329 New Market street, 62 hours.
Harry Gratchenburg, 329 New Market street, 62 hours.
Louisa Schmidt, 18 years, 483 Dillion street, 65 hours.
Joseph Targman, 407 York avenue, 14 years, 62 hours.
Morris Greenburg, 17 years, Eighth and Garden streets, 62 hours.
Max Kaufman, 16 years, 106 Gaskill street, 62 hours.
Jos. Rock, 14 years, 1230 Heath street, 63 hours.
Charles Leidman, 18 years, 342 North Second street, 65 hours.
Charles Pfromer, 14 years, 714 Plover street, no certificate, 63 hours.
Nathan Goldstein, 16 years, 730 Passyunk avenue, 62 hours.
Edgar Buck, 14 years, 1312 Myrtle street, no certificate, 62 hours.
Joseph Leidman, 20 years, 342 North Second street, 63 hours.
Adolph Greenburg, 16 years, 225 Fairmount avenue, 65 hours.
Frank Wallace, 16 years, Eighth and Garden, 62 hours.

ZIEGLER BROS., SHOE MANUFACTURERS, 119 NORTH FIFTH STREET.

Basement.

Wm. Cassidy, 1313 Simmons street, 14, no certificate.
John O'Drain, 106 Drinlser street, 15 and 11 months.
James Mellet, 202 Fernon street, 12 years, no certificate.

Second Floor.

Wm. Hoefler, 1117 Pearce street, 14, no certificate.
Harry Wolfe, 345 Juliana street, 15, no certificate, 9 months.
John McConnell, 1328 Noadine street, 13, no certificate.
Mamie Canell, 412 Jackson street, 14, no certificate, 4.
Robert Leamey, 1716 Palace street, 14, has certificate.
Martha Regan, 521 Moyamensing avenue, 14, 3 weeks.
Sallie Sullivan, No. 5 Dorham Place, 14, 8, no certificate.

Mary Shrinkle, 730 North Ninth street, 14, 9 months, no certificate.
Celie Boland, 217 Tree street, 14, 10 months, no certificate.
Mary Boyle, 2045 Puerce street, 14, 6 months, no certificate.
Mary Logue, 413 Tree street, 13, 9 months.
Katie Meer, 607 Moyamensing avenue, 14, no certificate, 1 week.
Annie Bradshaw, 537 Race street, 12, no certificate, 3 months.
Esther Landsburg, 806 South street (formerly Wincure's), 245 Eleventh street, 13, 9 weeks, no certificate.

Third Floor.

Anna Scott, 2422 Federal street, 13, 2 weeks, no certificate.
Lizzie Connelly, 2347 North Thirty-second street, 13, 1 week, no certificate. (1 shaft to case).

Fourth Floor.

Albert Miller, 616 Reech street, 14, 3 weeks, no certificate.
Eugene Reilley, 215 Erie street, 14, 1 year, no certificate.
H. J. Reier, foreman.

All the parties charged with violation in this instance being in the territory to which Mrs. McEnery has been assigned, I instructed her to commence proceedings against them all, which was done.

Then the defendants at once commenced to talk of being treated unfairly by me, notwithstanding the fact that the deputy has repeatedly ordered compliance with the law, and that copies of the same are freely furnished them, and their respective attentions called to their requirement.

On being informed that the object of the law could be achieved without pressing the cases to trial and causing their conviction, I notified my attorney, F. A. Hartranft, to invite them all to his office, which he did, where I made known to them my personal determination to have the law enforced during my official term as Factory Inspector. They one and all admitted that the law had been violated, and would hereafter maintain the same inviolate, whereupon I advised that the suits be withdrawn, provided that the defendants pay costs, which was done, each one writing Mr. Hartranft as follows:

“PHILADELPHIA, October 8, 1892.

F. A. HARTRANFT, Esq.,

“Attorney-at-Law, Philadelphia, Pa.:

“DEAR SIR: We have been apprised of the report made to the magistrate by a factory inspector concerning the requirements of a statute inhibiting the employment of minors under sixteen years of age without a sworn certificate from the parent or guardian setting forth the age of such minors, and would say that as far as we are concerned any omission to comply with the regulation has unhappily arisen from an inconsiderate oversight in failing to have our forepeople demand such affidavits from those applying for work. We have had the whole matter attended to, and will see that no further cause of complaint is given. Hoping this is entirely satisfactory, we are,

Very truly yours,
ZIEGLER BROS.”

"PHILADELPHIA, PA., Sept 29, 1892.

F. A. HARTRANFT, Esq., *Philadelphia, Pa.* :

DEAR SIR: Referring to our conversation of yesterday would say that when the inspectors visited our factories last week, and after going through informed us that we were violating the factory laws, we immediately obeyed their instructions and stopped all work in both places at 6 p. m. the same day, making 10 hours daily, and since that day have only worked the 10 hours, although it has caused us considerable loss, as our arrangements are such that our adults cannot continue their work without the assistance of the minors, of whom the majority average 18 years of age. We also secured certificates, signed by parents, of those who did not already have, whose ages range from 12 to 16; we have also moved all obstructions on the stairway, and have done all that we believe complies with the law.

We are sorry that we have violated the rules, and assure you that we shall be very careful in the future to be obedient to the demands, and will do what is required of us as good citizens.

We would be pleased to have the inspectors pay us another visit soon, and see, if in their judgment, all is as it should be.

Very truly yours,

HENSEL, COLLADAY & Co.
GEO. S. HENSEL, *Pres.*"

"PHILADELPHIA, PA., Oct. 8, 1892.

F. A. HARTRANFT, Esq. :

DEAR SIR: We find, through ignorance on our part, we have violated the law, in working minors more than 60 hours per week. Our impression was that hands over sixteen years of age could work overtime if they wished. We will be particular in future and comply strictly with the law. Hoping this will be satisfactory to you.

We remain yours truly,

E. H. GODSHALK & Co."

"PHILADELPHIA, October 6, 1892.

F. A. HARTRANFT, Esq., *Philadelphia, Pa.* :

DEAR SIR: After consulting with our clients, Messrs. Kauffman Brothers, we find that they have violated the first section of the act of May 20, 1889, in employing some minors more than sixty hours per week. They had no intention of violating the law, and they are desirous of complying with all the provisions of the said act, and you have their assurance through us that in the future there will be no further cause for complaint on the part of the Government officials.

Yours very truly,

BAUMBERGER & LEVI."

"PHILADELPHIA, October 8, 1892.

F. A. HARTRANFT, Esq., *Philadelphia, Pa.* :

DEAR SIR: Upon investigation we find the report made by Deputy Factory Inspector Mrs. McEnery, is so far correct, that a few minors have worked in our factory a few hours overtime, but this was done under a misinterpretation of the law relating to minors, as our foreman thought it related only to those under sixteen years of age, and the members of the firm were entirely ignorant of the fact.

However we have no desire to either evade or violate any laws, and assure you the provisions of the factory law will hereafter be strictly observed in our establishment.

Yours very respectfully,
M. W. LIPPER & Co."

We have made a very great number of investigations which have proved the complaints we have received to be groundless, or at least the matters complained of were not under our jurisdiction.

All that I said about the matter of fire escapes, and their erection, in my report, I can only repeat at present by emphasizing the necessity for such a change in the law.

On October 26 I received the following communication from his Excellency the Governor of the Commonwealth:

"HARRISBURG, October 26, 1892.

MR. ROBERT WATCHORN, *Factory Inspector, Harrisburg, Pa.:*

DEAR SIR: Will you please furnish me, at your early convenience, and not later than the first day of December next, a general statement of the condition of the department, board, or office of the State Government over which you have supervision, together with any suggestions you may see proper to submit relative to needed legislation in connection therewith.

"This request is made in accordance with section 10, article 4 of the constitution, which provides that the Executive may require information, in writing, from the officers of the Executive Department upon any subject relating to the duties of their respective offices, to enable him to give to the General Assembly information of the state of the commonwealth, and recommend to their consideration such measures as he may judge expedient.

Your prompt attention will be appreciated.

Very respectfully,

ROBERT E. PATTISON."

To which I replied as follows:

"HARRISBURG, November 23, 1892.

To His Excellency ROBERT E. PATTISON,

Governor of the Commonwealth:

GOVERNOR: I have the honor to make the following reply to your esteemed favor of October 26.

During the year commencing December 1, 1891, my department has performed a great deal of work which I am quite sure has been of a decidedly helpful character to the employes in manufacturing and mercantile establishments, and more particularly to the women and children.

This does not by any means indicate that the work of the department is not of a difficult character, but to those who are familiar with the nature of the work it is a matter of agreeable surprise that so much has been done.

The discoveries we have made justify the wisdom of the legislators who placed the factory act on the statute books and established a de

partment for its enforcement, it does more. It leaves no doubt as to the necessity for improved legislation along this line.

During the year some two thousand inspections have been made, which means nearly two inspections per day for each deputy, taking into account that one day per week is required for clerical work and that frequently they have to visit an establishment several times before one inspection is completed.

The total number of people employed in these two thousand factories and mercantile establishments is two hundred and thirty-one thousand, and I have only to say that it is necessary to talk with more or less of the people in order to carry out the work devolving upon us, to enable you to form an idea how much time and patience, not to say tact and skill, is required in order to properly carry out the work necessary to be done.

Two hundred and thirty-one thousand workers by no means embraces the whole army of employes in the establishments placed under the jurisdiction of this department, for we have been unable to reach them all, and at this writing I can only make mention of such places as we have been able to investigate.

To simplify our work it will be necessary to make several changes to which I am pleased to be able to call your attention.

The fire-escape law has been a source of much embarrassment and worry to us and certainly ought to be amended. For instance, we inspect a factory and find the means of egress in case of fire altogether inadequate, we naturally give an order to erect fire-escapes (under section 12 of the factory act), but we are frequently met with testimonials from the county or municipal authorities, as the case may be, to the effect that they have approved said fire-escapes, and hence we are unable to carry out this very important part of our work.

I would suggest that your Excellency endeavor to place the matter of exits from factories in the hands of this department, exclusive of the authorities above referred to.

The inclination to work children overtime has been more strongly manifested this year than last and we have been compelled to prosecute seven or eight manufacturers who do business on a large scale. All the cases have been satisfactorily settled in favor of the department and we have thus cured a very undesirable evil, but the children are still, in a very large measure, in need of further protection which can only be given them by amending section 1 of the factory act, so as to make it read, That no minor shall be employed in any factory or mercantile establishment for a longer period than ten hours per day, or sixty hours per week. As it reads at present it prohibits employment for a longer period than sixty hours per week, and I regret to say that it has frequently happened that children have been made to work sixty hours in four or five days which is a violation of the spirit, if not the letter of the law.

Section 4 permits the employment of children under age and permits them to work without restriction, provided a less number than ten are employed. This should be abolished for it is the unanimous opinion of the department that these small establishments, over which we have no jurisdiction, are really worse than many of the larger ones, and yet they continue to compete with the larger establishments, being exempted from the expenses incident to carrying out the orders of the factory inspector.

The department should certainly be enlarged at least to double its size in order to successfully cope with its increasing duties.

The work of ascertaining the earning capacity of the factory employes should be imposed upon this department, provided the force is increased, for there is no more successful way to obtain this very important information. Under the law I am able to inform you that the conditions under which women and children labor are very greatly improved.

I am very pleased to be able to say that the 1,700 orders for fire-escapes, improved lavatories, safety elevator gates, guards for dangerous machinery, certificates for children under sixteen years have all been complied with, thus giving the women and children concerned inestimable comfort and satisfaction, but I am not able to make report on the vital question of earnings which if I were privileged to do I am convinced the report would be quite surprising and in the end would be helpful to the wage earner.

One case in particular was reported to me by Deputy Inspector Miss Mary O'Reilly, of Philadelphia, where she states she found children between the ages of twelve and fourteen years working sixty-hours per week for one dollar and twenty cents per week, and she asked if it were her duty to collect these statistics, which, of course, I answered in the negative, but I believe it will be of great service to the Commonwealth and help to the factory hands if such duty should be imposed upon this department, because of its peculiar fitness to collect the facts relative to wages. Another matter needs correcting, namely, the enforcement of the semi-monthly pay law.

The mine inspectors ought to be made responsible for the enforcement of this law in their respective territories, and the factory inspectors would then have to enforce the law only where they have jurisdiction instead of all over the commonwealth as at present.

The desire for Saturday half holiday is still as manifest as ever, and we are constantly in receipt of applications for permits to shorten the meal time so as to have the time thus served credited to the following Saturday, with a view to earlier dismissal on that day. Hasty meals and a rush back to work cannot be conducive to health, and ought not to be encouraged, and I feel quite convinced that a Saturday half holiday for all women and children is not only desirable, but it will shortly after adoption be regarded as a very humane and beneficial innovation.

It affords me more than ordinary pleasure to be able to report that the discipline and ability of the force which I have had the honor to direct and assist, has been of a very excellent and desirable standard, all having striven to sustain Your Excellency in his desires to properly administer the affairs of the commonwealth.

I am also indebted very largely to the law department of the state, and I beg to acknowledge through you my sense of appreciation of the helpful advice I have always received therefrom upon application.

I herewith submit a summary of the work done for the year commencing December 1, 1891, together with the following recapitulations of recommendations:

First. An increased force of factory inspectors.

Second. An increased appropriation for expenses of deputy inspectors.

Third. The placing of all manufacturing establishments under the jurisdiction of the Factory department.

Fourth. The right of factory inspectors to collect statistics on the earnings of factory employes.

Fifth. The restriction of the hours of labor of minors and women to ten hours per day and a half day on Saturday.

Sixth. The matter of exits from factories in case of fire to be left with the Factory department without conflicting orders of municipal or county authorities.

Seventh. The publishing of the Inspector's report separate from other reports.

All of which is most respectfully submitted.

I am with great respect,

Your most obedient servant,

ROBERT WATCHORN.

SUMMARY OF WORK DONE BY THE DEPARTMENT FROM DECEMBER 1, 1891, TO NOVEMBER 30, 1892.

Number of deputy inspectors on inspection work,	5
Number of inspections made,	2, 059
Number of males employed where inspections have been made,	134, 446
Number of females employed where inspections have been made,	96, 462
Number between twelve and sixteen years of age employed where inspections have been made,	33, 217
Number of children under twelve years of age found employed and discharged,	9
Total number of employes in establishments that have been inspected,	230, 908
Total number of orders given,	1, 709
As follows: Fire escapes to be erected,	187
Elevators to be guarded,	171

Sanitary orders given,	319
Miscellaneous,	1, 032
Orders reported complied with,	1, 328
Number of accidents reported,	246
As follows : Fatal,	24
Serious,	97
Less serious,	125

I have inserted my reply to the Governor in order that the recommendations I therein made may become a part of this report.

I am very pleased to be able to state that the conditions in mill, and store, shop and factory, are, on the upward tendency, a vigorous application of the law, the watchfulness and faithful services of my assistants has in a great measure tended to ameliorate the conditions of the women and children employed in mercantile and manufacturing pursuits in this great commonwealth.

Collection of statistics on the wage question does not devolve upon this department, and, therefore, I am not permitted to report many things which come under our daily observation, and this information is withheld which vitally concerns the state, and every upright citizen.

The "sweating system" which has been a subject of investigation on the part of the United States Government, has disclosed the fact that Philadelphia is the first city in the United States, in carrying on of the "sweating system." It is well known to us that it exists, and that tender children and feeble women are employed, who toil long weary hours for a mere pittance, and I may say, that were it incumbent on my department to collect these facts, that we could astonish the commonwealth with an array of facts and figures, which would defy contradiction, and which would amaze thousands of good citizens who are now passive on this great question, because they are unconscious of the prevalence of this great evil. Surely no humane being can be interested in perpetuating a state affair so eloquently, and so truly given by the poet Hood in his "Song of the Shirt."

" Work, work, work,
Till the brain begins to swim,
Work, work, work,
Till the eyes are heavy and dim,
Seam and gusset and band—
Band and gusset and seam,
Till over the buttons I fall asleep,
And sew them on in a dream.

Oh ! men with sisters dear,
Oh ! men with mothers and wives,
It is not linen you're wearing out
But human creatures' lives !
Stitch, stitch, stitch,
In poverty, hunger and dirt,
Sewing at once with a double thread,
A shroud as well as a shirt."

But true it is that such is the sad fate of many of the working-women of this state, yet I am quite hopeful that we shall shortly receive additional strength and enlarged powers of usefulness so as to cope with this hitherto unrestricted abuse.

In conclusion, I desire to pay my respects to the deputies who have rendered me such invaluable aid, during the year, for it is but meet to say that to their indefatigable and intelligent labors is due the unquestionable success of the department.

To the manufactures and employes who have voluntarily rendered us assistance I desire also to pay my compliments and to assure them of my hearty appreciation.

I am very respectfully,

ROBERT WATCHORN,
Factory Inspector.

ACCIDENT REPORTS OF B. T. CASTLES.—SECOND DISTRICT.

Date of accident.	PERSON INJURED.	Age.	Establishment in which accident occurred.	Location.	Machine, etc., on which accident occurred.	Particulars and extent of injury.
1892.						
Feb. 24,	Daniel Delauey, . .	35	Sheldon Axle Company,	Wilkes-Barre,	Pump,	Scalded by escaping steam and water; face and eyes burned.
March 9,	John Harrison, . . .	13	Arnold & Co.,	Lancaster, Pa.,	Tapering machine,	Carelessness; loss of two fingers.
May 18,	Matthew Kamiuski, . .	12	Reading Hardware Company, . .	Reading,	Butt milling machine,	Negligence; arm severely cut.
May 31,	Katie Fisher, . . . . .	...	Arnold & Co.,	Lancaster,	Tapering machine,	Negligence; loss of two fingers.
June 25,	Wm. Higgins,	25	Phoenix Manufacturing Co., . .	Pottsville, Pa.,	Hydro extractor,	Collapse of outside cast iron casting of hydro extractor; loss of forearm.
July 5,	Jacob Shelley,	35	Grey Iron Casting Company, . .	Mt. Joy,	Emery stand,	Emery wheel bursted and fractured his skull; resulting in death.
July 10,	Unknown, . . . . .	...	Seaton & Baines,	Allentown,	Hydro extractor,	Slipped on floor of soaking room and to save himself threw out his hand and got it into the hydro extractor; loss of arm.
Aug. 2,	Mable M. Reasner, . .	15	Chambersburg Hosiery Company,	Chambersburg,	Shafting,	Hair cut off left side of head caused by placing belting on pulley.
Aug. 16,	George Hipp,	15	F. S. Wertz & Co.,	Reading,	Cross rolls,	Hand caught between a pair of rolls; left hand squeezed from tip of fingers where thumb joins hand; no bones broke.
Oct. 23,	Walter Pope,	14	Standard Silk Company,	Tobyhanna,	Wringer on drying machine,	Both arms broken by needlessly meddling with the machine.

REPORT OF B. T. CASTLES—SECOND DISTRICT—1892.

PITTSBURGH, PA., LUZERNE COUNTY.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.			Sanitary Condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12.	12 to 16.			
Alpine Knitting Mill,	Underwear,	6	94	..	5	June 6.	Comply with sections 2 and 3 and erect fire escape.	
Galland Bros.,	Ladies' underwear,	2	128	..	4	June 6.		
Pittston Box Factory,	Boxes,	3	16	..	..	June 6.	Securely enclose unused elevator and properly enclose belts.	Complied.
H. B. Brown,	Dry goods,	11	19	..	2	June 7.	Comply with sections 2 and 3 and erect fire escape.	
Luzerne Knitting Mill,	Underwear,	24	61	..	8	June 7.		
Hitchner & Co.,	Crackers,	6	9	..	1	June 7.	Comply with sections 2 and 3 and have females water closet separate and apart.	Complied.

PLYMOUTH, LUZERNE COUNTY, PA.								
John R. Powell,	Mining squibs,	3	93	..	28	June 15.	Keep record book. Post notice of working hours and have water closets separate and apart.	Complied.
Pioneer Knitting Mill,	Hosiery,	6	157	..	68	June 15.	Comply with sections 2 and 3,	Complied.
Wyoming Valley Sult Company,	Men and ladies' garments,	3	91	..	23	June 15.	Comply with sections 2 and 3, water closets for females separate and apart, and erect fire escape.	Complied.

WHITE HAVEN, LUZERNE COUNTY, PA.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.				Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12.	12 to 16.				
Acme Hosiery Mill,	Hosiery,	5	25	. .	9	Fair,	Aug. 19,	Comply with sections 2, 3 and 10.	
Bridgeport Klindling Wood Co.,	Kindling wood,	25	12	. .	10	do.	Sept. 12.		

WILKES-BARRE, LUZERNE COUNTY, PA.

Boston Store,	Dry goods,	35	50	..	2	Good,	June 9,	Comply with sections 2, 3 and erect fire escape.	Complied.
Langfeld, Lazarus & Co.,	do. do.	10	25	..	..	do.	June 9.	Post notice of working hours.
Crescent File and Tool Company,	Files and rasps,	58	2	..	8	do.	June 9,	Comply with sections 2 and 3,	
Sanson Cutlery Company,	Table cutlery.	106	4	..	8	do.	June 9.	Erect stairway to upper floor at entrance to building.	Complied.
Newell Clothing Company,	Overalls and pants,	5	57	..	1	do.	June 10,		
Wilkes-Barre Lace Manufacturing Company,	Lace,	190	216	..	36	do.	June 10,	Automatic traps to elevator.	Complied.
Wyoming Valley Lace Mill, . . .	do.	13	14	..	..	do.	June 10,	Erect fire escape.
Galland Bros. & Co.,	Ladies' underwear,	30	420	..	80	do.	June 13.		
Isaac Long,	Dry goods and carpets,	18	24	..	6	do.	June 13.		
Jonas Long,	Dry goods and millinery, . . .	35	65	..	..	do.	June 13.	

SOUTH WILKES-BARRE.

Hess, Goldsmith & Co.,	Silk dress goods,	25	235	..	22	Good,	June 9,	
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SCRANTON, LACKAWANNA COUNTY, PA.

Clark, Snover & Co.,	Smoking tobacco,	14	58	Good.	Jan. 4.		
Boston Dry Goods Store,	Dry goods,	30	10	. . . . .	do.	Jan. 4.		
Freeman Manufacturing Co.,	Overalls and pants,	2	28	. . . . .	do.	Jan. 4.		
Gross, Foster & Co.,	Dry goods and notions,	13	12	. . . . .	do.	Jan. 4.		
Globe Store,	Dry goods,	53	26	. . . . . 6	do.	Jan. 4.		
Short & Flynn,	Cigars,	12	14	. . . . . 4	do.	Jan. 5.		
Charles Gwetzing,	Ladies' underwear, . . . . .	. . . . .	105	. . . . .	do.	Jan. 5.		
A. Harvey,	Silk throwing,	8	192	. . . . . 16	do.	Jan. 5.	Comply with sections 2, 3 and 11.	Complied.
Lingleton Silk Mill,	do.	20	148	. . . . . 21	do.	Jan. 5.	Comply with sections 2 and 11.	Complied.
The Lackawanna Mills,	Underwear,	145	205	. . . . . 22	do.	Jan. 6.		
Scranton Button Company,	Buttons,	42	91	. . . . . 15	do.	Jan. 6.		
Sanquitt Silk Manufacturing Company,	Silk,	50	800	. . . . . 304	do.	Jan. 6.		
Thos. Lucas & Son,	Dry goods,	11	13	. . . . . 1	do.	Jan. 7.		
Goldsmiths Bros. & Co.,	do. do.	25	20	. . . . . 6	do.	Jan. 7.		
Becker Bros.,	Cigars,	4	12	. . . . .	do.	Jan. 7.		
W. S. Blanchard,	Cigars and paper boxes,	2	23	. . . . .	do.	Jan. 7.		
Scranton Glass Company,	Glass bottles,	112	. . . . . 78	. . . . .	do.	Jan. 8.		
Garney, Brown & Co.,	Cigars,	38	37	. . . . . 8	do.	Jan. 8.		
Eureka Laundry Company,	Laundry,	2	14	. . . . .	do.	Jan. 8.		
Lackawanna Steam Laundry,	do.	11	30	. . . . .	Bad,	Jan. 8.	Post hours of labor and provide water closets for females, screened and well ventilated.	Complied.
Charles Gwetzing,	Ladies' underwear, . . . . .	. . . . .	140	. . . . .	Good.	June 8,	Erect fire escape.	Complied.
Scranton Jar and Stopper Co.,	Bottle fasteners,	25	30	. . . . . 34	do.	June 15,	Comply with sections 2 and 3 and guard holst and stairway.	Complied.
Scranton Glass Company,	Bottles,	350	. . . . . 20	. . . . .	Fair,	June 17,	Comply with section 2 and 3.	Complied.
Garney, Brown & Co.,	Cigars,	42	43	. . . . . 16	Good,	June 17,		

SCRANTON, LACKAWANNA COUNTY, PA.—Continued.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.			Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12. 12 to 16.				
Clark & Snover Co.	Tobacco.	10	70	. . .	Good.	June 17.		
Lace Curtaln Manufacturing Co.,	Lace Curtalns.	60	70	. . . 35	do.	June 18.	Post legal notice of working hours and erect fire escape.	Complied.
George Singleton,	Silk throwing,	22	158	. . . 30	do.	June 20.		
Scranton Button Works,	Buttons,	50	50	. . . 30	do.	June 20.	Automatic traps to elevator and erect fire escape.	Complied.
The Lackawanna Mills,	Underwear,	125	300	. . . 23	do.	June 20.		
Sanquint Silk Mill,	Silk,	90	1,050	. . . 306	do.	June 21.	Comply with section 3,	Complied.
Alfred Harvey,	Silk throwing,	10	190	. . . 45	do.	June 21.		
Goldsmith Bros. & Co.,	Merchandise store,	25	25	. . . 10	do.	June 22.	Comply with section 2 and 3,	Complied.
Globe store,	Dry goods,	56	37	. . . 7	do.	June 22.		
Becker Bros.,	Cigars,	4	12	. . . . .	do.	June 23.		

STROUDSBURG, MONROE COUNTY, PA.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.			Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12. 12 to 16.				
Muehling & Johnson,	Hosiery,	50	150	. . . 15	Good.	Jan. 18.		
John C. Kyle and Co.,	Silk throwing,	50	150	. . . 95	do.	Jan. 18.	Comply with sections 2, 3 and 11,	Complied.
Stroudsburg Woolen Mill,	Woolen goods,	48	80	. . . 40	do.	Jan. 18.		
Stroudsburg Knitting Mill,	Knit goods and ladies coats,	25	75	. . . 9	do.	July 15.	Automatic traps to elevator and erect fire escape.	

Stroudsburg Woolen Mill.	Woolen goods,	60	40	..	12	do.	251	April	Comply with sections 2, 3, 7 and erect fire escape.
John C. Ryie & Co.,	Silk throwing.	50	150	..	90	do.	July	15.	

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TOBYHANNA, MONROE COUNTY, PA.

Standard Silk Mill,	Silk throwing.	35	20	..	6	Fair,	June 24,		Comply with sections 2 and 3,	Complied.
Tobyhanna and Lehigh Lumber Company.	Clothes plus,	26	19	..	2	do.	June 24,		Comply with sections 1, 2, 3 and 7,	Complied.

ALLENTOWN, LEHIGH COUNTY, PA.

Ithue Bros.,	Cigars,	31	44	..	6	Good,	Jan. 11.			
Hartung, Fried & Grim,	Shoes,	52	16	..	5	do.	Jan. 11.			
Wolf Shoe Manufacturing Co.,	do. . . . .	..	18	..	..	do.	Jan. 11.		Comply with sections 2 and 3,	Complied.
Eagle Steam Cigar Box Factory,	Cigar boxes,	9	8	..	4	do.	Jan. 12.			
John E. Lentz,	Boots and shoes,	95	35	..	10	do.	Jan. 12.			
H. Leh & Co.,	Shoes,	108	42	..	17	do.	Jan. 12.			
W. H. Ryan,	Boxes,	5	25	..	4	do.	Jan. 12.			
Roney & Berger,	Shoes,	21	21	..	4	do.	Jan. 12.			
Allentown Spinning Company,	Jute spinning,	185	300	..	125	do.	Jan. 13.			
Adelaide Silk Mill,	Silk goods,	250	400	..	65	do.	Jan. 13.			
Pioneer Silk Mill,	Silk yarns,	200	150	..	60	do.	Jan. 13.			
Seaton and Baines,	Silk throwing,	45	40	..	11	do.	Jan. 13.			
Palace Ribbon Manufacturing Company.	Ribbons,	30	20	..	..	do.	Jan. 13.			
Lichten Bros.,	Cigars,	50	100	..	6	do.	Jan. 14.			
W. R. Lawser & Co.,	Hosiery and overalls,	45	30	..	10	do.	Jan. 14.			
Allentown Woolen Mills,	Hosiery and quilts,	16	50	..	14	do.	Jan. 14.		Comply with sections 2 and 3,	Complied.

ALLENTOWN, LEHIGH COUNTY, PA.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.			Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12. 12 to 16.				
Hartung, Fried & Grim,	Shoes,	57	18	..	4	June 27.	Automatic traps to elevator; water closets separate and apart, and erect fire escape.	Complied.
Wolf Shoe Manufacturing Co., . . .	do.	32	18	..	2	June 27,	Automatic traps to elevator and place certificates on file for all children in your employ.	Complied.
Rhne Bros.,	Cigars,	40	38	..	4	June 25,	Comply with sections 2, 3, 7, and have water closets separate and apart; also erect fire escape.	Complied.
P. Schneider & Son,	Shoes,	16	17	..	2	June 28,	Comply with sections 2 and 3,	Complied.
Roney & Bergen,	do.	32	18	..	5	June 28.		
W. H. Ryan,	Paper boxes,	5	25	..	4	June 28.		
Seaton & Baines,	Silk throwing,	30	70	..	50	June 29,	Comply with sections 2 and 3,	Complied.
Palace Ribbon Manufacturing Co.,	Weaving silk ribbons,	40	20	..	4	June 29,	Comply with sections 2 and 3,	Complied.
Pioneer Silk Mill,	Silk,	154	196	..	75	June 29,	Comply with sections 3 and 7,	Complied.
H. Leh & Co.,	Shoes and dry goods,	90	60	..	19	June 30,	Automatic traps to elevator,	Complied.
John M. Stevens,	Cigar boxes,	6	10	..	..	June 30,	Guard hoist, water closets separate and apart and erect fire escapes,	Order for fire escape complied with.
Henry Gabriels & Son,	Hosiery and quilts,	20	72	..	27	June 30,	Water closets separate and apart, and erect fire escape.	
John E. Lentz,	Boots and shoes,	85	30	..	12	June 30,	Automatic traps to elevator and have water closets separate and apart.	Complied.
Adelalde Silk Mill,	Silk goods,	270	500	..	74	July 1,	Automatic traps to elevator, erect fire escape, ropes, chains, etc.	Order revoked for fire escape. Ropes and chains complied with.

Lichten Bros.,	Cigars,	125	75	50	July 1.	Place certificates on file and automatic traps to elevator.	Complied.
Allentown Spinning Company,	Jute spinning,	230	250	145	July 6,		

CATASAUQUA, LEHIGH COUNTY, PA.

Wahnetah Silk Company.	Silk plush.	57	28	3	Good, Jan. 22,	Comply with sections 2 and 3.	Complied.
Union Silk Manufacturing Co.,	do.	90	60	21	do. Jan. 22.		
Unicorn Silk Manufacturing Co.,	Silk plushes.	100	80	34	do. July 7.	Comply with sections 2 and 3.	Complied.
Wahnetah Silk Company,	do.	88	12	do.	do. July 7.		

SLATINGTON, LEHIGH COUNTY, PA.

Fulmer's Factory,	School slates,	5	35	12	Good, Jan. 22.	Erect fire escape and guard stairway.
Thomas Kane & Co.,	do.	6	32	5	do. Jan. 22.	
do.	do.	12	65	17	Fair, Aug. 18,	
E. L. Kraus.	do.	do.	37	9	Good, Aug. 18.	

MACUNGIE, LEHIGH COUNTY, PA.

Valley Mill.	Hosiery,	4	34	17	Good, June 1.
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EMAUS, LEHIGH COUNTY, PA.

Emaus Knitting Mill,	Hosiery,	do.	24	13	Good, June 2.
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HARRISBURG, DAUPHIN COUNTY, PA.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.			Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12.	12 to 16.			
Monaghan-Bay Company,	Shoes,	105	75	..	9	Feb. 1.	Comply with section 3 and provide wash rooms for females.	Complied.
Harrisburg Silk Mill,	Silk goods,	25	275	..	19	Feb. 1.		
Dives, Pomeroy & Stewart, . . .	Dry goods,	50	50	..	6	Feb. 2.	Comply with sections 2 and 3 and provide wash rooms for females.	Complied.
Harrisburg Manufacturing Co., . .	Overalls and shirts,	6	14	..	..	Feb. 2.	Comply with section 10.	Complied.
Capital Shirt Company,	Shirts, . . . . .	..	47	..	..	Feb. 4.	Provide wash rooms for females.	Complied.
A. Reeder Ferriday,	Paper boxes,	6	19	..	2	Feb. 4.	Comply with sections 2, 3 and 10,	Complied.
Harrisburg Boot and Shoe Co., . .	Shoes,	123	91	..	..	Feb. 5.	Provide wash rooms for females,	Complied.
Harrisburg Manufacturing Co., . .	Pantaloon and overalls, . . . .	..	39	..	..	May 19.	Automatic traps to elevator and erect fire escape.	Complied.
Meyers' Printing House,	Printing and binding,	100	100	..	..	May 19.	Automatic traps to elevator and erect fire escape.	
Capital Shirt Company,	Shirts, . . . . .	..	47	..	..	Aug. 4.	Screen water closet, place hydrant inside of factory and erect outside stairway.	
Harrisburg Boot and Shoe Co., . .	Boots and shoes,	153	117	..	4	Nov. 15.	Erect fire escape,	
Harrisburg Silk Mill,	Silk throwing and weaving, . .	35	325	..	25	Nov. 21.	Place certificates on file for all children under sixteen years of age.	
Harrisburg Manufacturing Co., . .	Shirts and overalls,	1	54	..	..	Nov. 21.		
Ferriday Paper Box Company, . . .	Paper boxes,	7	22	..	9	Nov. 21.		
Capital Shirt Factory,	Shirts, . . . . .	..	71	..	..	Nov. 21.		

STEELTON, PA.

Capital Shirt Company,	Shirts,	10	90	10	Fair.	Feb. 3,	Provide wash rooms for females,	Complied.
Capital Shirt Company,	do.	5	67	10	Good.	Nov. 15,	Comply with section 2 and erect fire escape.	

MILLERSBURG, DAUPHIN COUNTY, PA.

Klein, Metz & Co.,	Carpets,	26	14	5	Fair.	May 17,	Comply with sections 2 and 3 and have water closets for females separate and apart.	Complied.
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WILLIAMSTOWN, DAUPHIN COUNTY, PA.

Williamstown Stocking Factory,	Hosiery,	1	34	11	Good.	Oct. 25,	Comply with sections 2 and 3,	Complied.
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WICONISCO, DAUPHIN COUNTY, PA.

Kemmel & Monop.,	Hosiery,	3	97	30	Fair.	Oct. 24,	Comply with section 2 and have water closets separate and apart.	
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EASTON, NORTHAMPTON COUNTY, PA.

Bader Bros.,	Dry goods and carpets,	11	12	1	Good.	Jan. 19,	Comply with sections 2 and 3,	Complied.
William Laubach & Son,	do.	17	27	..	do.	Jan. 19,		
R. & H. Simon,	Silk throwing,	70	110	120	do.	Jan. 19,	Comply with section 11,	Permit granted.
Easton Boot and Shoe Company,	Boots and shoes,	125	25	6	do.	Jan. 19,		
Lehigh Mills Company, No. 1,	Cotton goods,	63	102	58	do.	Jan. 19,	Comply with section 3,	Complied.
Lehigh Mills Company, No. 2,	Spinning and weaving cotton goods,	16	48	2	do.	Jan. 19,	Comply with section 11,	Permit granted.
Bush & Bull,	Dry goods,	29	24	1	do.	Jan. 20,	Comply with sections 2 and 3,	Complied.
Lehigh Mills Company,	Weaving cotton goods,	19	64	4	do.	July 11,	Erect fire escape,	Complied.

EASTON, NORTHAMPTON COUNTY—Continued.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.			Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12. 12 to 16.				
Lehigh Mills Company	Cotton spinning,	44	51	..	19	July 11.		
Laubach & Son,	Dry goods and carpets,	19	24	..	..	July 12.		
Bush & Bull,	do. do.	32	24	..	2	July 12.		
R. & H. Simon,	Silk throwing,	70	80	..	30	July 12.	Erect fire escape.	
Easton Boot and Shoe Company, .	Boots and shoes,	115	25	..	10	July 12.	Water closets separate and apart and erect fire escape.	Complied.

SOUTH EASTON.

John Hirley,	Overalls and shirts, . . . . .	..	45	..	5	Jan. 20.	Comply with sections 2 and 3,	
Hirley's Overall Factory,	Shirts, overalls and pants, . . .	..	45	..	6	July 11.	Erect fire escape and comply with sections 2 and 3.	Complied.

BETHLEHEM, NORTHAMPTON COUNTY, PA.

South Bethlehem Knitting Mill, .	Hosiery,	10	135	..	27	Jan. 21.		
Lehigh Valley Silk Mill,	Dress goods,	112	88	..	84	Jan. 21.		
Cutter Silk Manufacturing Co., .	Silk,	100	400	..	75	Jan. 21		
Fichter & Martin,	Silk ribbons,	110	40	..	13	Jan. 21.		

Bethlehem Silk Company,	Silk throwing,	80	120	50	do.	Jan. 21.	Complied.
Fichter & Martin,	Silk ribbons,	65	50	19	do.	July 7,	Comply with sections 2 and 3,
Bethlehem Silk Company,	Silk throwing,	95	110	80	do.	July 7,	Comply with sections 2, 3, and erect fire escape.
Harbison & Graham,	Chenille curtains and draperies.	10	20	10	do.	July 8,	Comply with sections 2, 3, and have water closets separate and apart.
Lipps & Sutton,	Silk throwing and weaving, .	90	85	65	do.	July 8,	Erect fire escape.
Cutter Silk Manufacturing Co., .	do.	150	350	140	do.	July 8,	Erect fire escape,
Order revoked.							

NAZARETH, NORTHAMPTON COUNTY, PA.

H. Kramer's Hosiery Mill,	Hosiery,	23	70	1	23	Good,	July 13,	Comply with sections 2, 3, and guard stairway.	Complied.
Nazareth Manufacturing Co., . .	Knit goods,	7	93	. .	5	do.	July 13,	Comply with section 3, and have water closets separate and apart.	Complied.

BANGOR, NORTHAMPTON COUNTY, PA.

H. Wise,	Slate blndng.	22	11	Fair,	July 14,	Comply with sections 2 and 3.	Complied.
Hyatt School Slate Factory, . . .	School slates,	45	19	. .	16	Good,	July 14,	Comply with sections 2, 3 and 7,	

LANCASTER CITY, PA.

Lancaster Caramel Company, . .	Caramels,	200	400	. .	150	Good,	Dec. 1.	
Conestoga Steam Cotton Mill No. 1.	Cotton goods,	130	160	. .	69	do.	Dec. 1.	
Conestoga Steam Cotton Mills Nos. 2 and 3.	do.	300	500	. .	133	do.	Dec. 1.	
Lancaster Silver Plate Company.	Silver plating,	64	12	. .	. .	do.	Dec. 1.	
Oblinger Bros. & Co.,	Cigars,	120	120	. .	11	do.	Dec. 2.	
J. R. Metzger & Co.,	Cigars and leaf tobacco, . . .	45	55	. .	3	do.	Dec. 2.	

LANCASTER CITY, PA.—Continued.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.				Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12.	12 to 16.				
Ephraim Bushey,	Cigars,	7	18	..	3	Bad.	Dec. 2.	Comply with sections 2, 3 and 10,	Complied.
S. R. Moss (Cigar Company), . .	do.	50	50	..	8	Good.	Dec. 2.	Comply with sections 2, 3, and designate water closets.	Complied.
Phoenix Cork Works,	Corks,	34	16	..	22	do.	Dec. 2.		
Lancaster Cork Works,	do.	27	33	..	11	do.	Dec. 2.		
Arnold & Co.,	do.	70	100	..	40	do.	Dec. 2.		
John F. Reed & Co.,	Cigars,	13	22	..	1	do.	Dec. 3.		
Reist & Co.,	do.	7	11	..	..	do.	Dec. 3.		
Front & Shank,	Shirts, . . . . .	..	16	..	..	do.	Dec. 3.		
Strauss Bros.,	Cigars,	25	50	..	4	do.	Dec. 3.		
Jacobs & Co.,	do.	20	60	..	15	do.	Dec. 3.	Comply with sections 2, 3 and 10,	Complied.
Wickersham Printing Company, .	Printing and binding,	60	15	..	..	do.	Dec. 3.		
Astrich Bros.,	Millinery and dry goods,	18	46	..	2	do.	Dec. 3.	Comply with sections 2, 3 and 12,	Complied.
Union Lock Company,	Padlocks,	32	1	..	7	do.	Dec. 4.	Comply with sections 2, 3, 10 and 12,	Complied.
Prangley Cigar Factory,	Cigars,	26	1	..	..	do.	Dec. 4.	Post notices and place automatic doors to elevator.	Complied.
Hager Bros.,	General merchandise,	15	15	..	3	do.	Dec. 4.	Comply with sections 2 and 3,	Complied.
Willamson & Foster,	Dry goods,	47	19	..	6	do.	Dec. 4.	Comply with sections 2 and 3,	Complied.
Watt & Shand,	do.	22	13	..	6	do.	Dec. 4.		
F. L. Krauskop,	Cigar boxes,	31	13	..	9	do.	Dec. 7.		
Rose Bros. & Hartman,	Umbrellas and parasols,	35	140	..	14	do.	Dec. 7.		

Stevens Cotton Mill,	Cotton.	30	70	38	do.	Dec. 8,	Post names of children; designate water closets and place automatic traps to elevator.	Complied.
Keystone Standard Watch Co.,	Watches,	100	100	6	do.	Dec. 8,	Comply with sections 2 and 3.	
Lancaster Caramel Company,	Caramels,	114	400	167	do.	April 18.		
Conestoga Mills 2 and 3,	Cotton,	300	500	104	do.	April 18,	Automatic traps or doors to elevator.	
F. Shroder & Co.,	do.	118	142	61	do.	April 18,	Comply with section 3,	Complied.
Ephraim Bushey,	Cigars,	7	18	9	do.	April 19.		
J. R. Moss,	do.	19	9	..	do.	April 19.		
Conestoga Cork Works,	Corks,	86	86	51	do.	April 19.		
John F. Reed & Co.,	Cigars,	7	18	2	do.	April 19,	Comply with section 7, and have water closets separate and apart.	
Oblinger Bros. & Co.,	do.	120	130	12	do	April 20,	Comply with section 10, and fireescape law,	Complied.
Lancaster Cork Works,	Corks and cork machinery,	35	33	10	do.	April 20,	Comply with section 7, and erect fire escape.	Complied.
Phoenix Cork Works,	Corks,	45	15	19	do.	April 20.		
W. M. Jacobs & Co.,	Cigars,	10	40	17	do.	April 20.		
H. S. Shirk & Son,	Cotton yarns,	44	60	35	do.	April 21.		
Rose Bros. & Hartman,	Umbrellas,	50	175	21	do.	April 21,	Have water closets separate and apart, . .	Complied.
J. L. Krauskop,	Cigar boxes,	28	12	8	do.	April 21.		
Reist & Co.,	Cigars,	14	5	2	do.	April 22.		
Trout & Shank,	Shirts and laundry,	4	16	..	do.	April 22.		
Williamson & Foster,	Dry goods,	34	18	6	do.	Aug. 9,	Erect fire escape.	
Watt & Shand,	do.	38	12	6	do.	Aug. 9,	Erect fire escape.	
Wickersham Printing Company,	Printing and binding,	63	12	..	do.	Aug. 9.		
Hager & Bro.,	Dry goods and carpets	35	25	4	do.	Aug. 10,	Comply with sections 2 and 3.	Complied.

COLUMBIA, LANCASTER COUNTY, PA.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.				Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12.	12 to 16.				
Triumph Shirt Company,	Shirts,	4	88	..	..	Good.	Feb. 18.		
John Fendrick,	Cigars,	12	6	..	..	do.	Feb. 18.		
John Fendrick,	do.	17	13	..	5	Fair,	Oct. 19.	Comply with sections 2, 3, and have water closets separate and erect fire escape.	
Columbia Lace Company,	Lace,	24	30	..	4	Good.	Oct. 19.	Comply with sections 2 and 3,	Complied.
Triumph Shirt Company,	Shirts,	5	65	..	2	do.	Oct. 19.		

MANHEIM, LANCASTER COUNTY, PA.

Enterprise Hosiery Mhl.	Seamless hosiery,	24	72	..	11	Good.	Feb. 17.	Comply with sections 2 and 10,	Complied.
T. S. Beck,	Cigars,	13	12	..	..	do.	Feb. 17.	Comply with section 10,	Complied.
Manheim Caramel Factory.	Caramels,	2	12	..	5	Fair.	Aug. 11.	Comply with sections 2 and 3,	Factory closed.
T. S. Beck,	Cigars,	12	11	..	..	do.	Aug. 11.		
Enterprise Hosiery Mill,	Hosiery,	20	90	..	13	do.	Aug. 11.		

NEW HOLLAND, LANCASTER COUNTY, PA.

Dillworth Bros.,	Cigars,	41	19	..	3	Good.	Aug. 15.	Comply with sections 2 and 2,	Complied.
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LITITZ, LANCASTER COUNTY, PA.

H. S. Melskey,	Cigars,	51	24	..	4	Fair.	Aug. 12.	Comply with sections 2, 3, and have water closets separate and apart.	Complied.
H. S. Fredrick,	do.	16	12	..	..	do.	Aug. 12.	Comply with section 2,	Complied.

TERRE HILL, LANCASTER COUNTY, PA.

Dillworth Bros.,	Cigars,	85	35	..	8	Bad,	Dec. 10.	Comply with sections 3 and 10,	Complied.
A. M. Clime & Co.,	do.	30	40	..	2	Good,	Dec. 10.	Comply with sections 2, 3, and designate water closets.	Complied.
S. S. Watts,	do.	30	15	..	4	do.	Dec. 10.		
R. H. Davis,	do.	13	13	..	1	do.	Dec. 10.		
S. S. Watts,	do.	25	20	..	8	Fair,	Aug. 16.	Have water closets separate and apart, . .	Complied.
Dillworth Bros.,	do.	55	45	..	15	do.	Aug. 16.	Have water closets separate and apart, . .	Complied.
Weaver & Bro.,	do.	9	14	..	2	do.	Aug. 16.	Comply with sections 2, 3 and 10,	Complied.
A. G. Glasser,	do.	21	9	..	3	do.	Aug. 16.	Comply with sections 2, 3 and 10.	

BROWNSTOWN, LANCASTER COUNTY, PA.

J. L. Mumma,	Cigar boxes,	7	18	..	..	Fair,	Aug. 15.	Post notice of working hours and guard stairway.	Complied.
J. L. Mumma,	Cigars,	29	11	..	..	do.	Aug. 15.	Post notice of working hours,	Complied.

EPHRATA, LANCASTER COUNTY, PA.

A. W. Meitzer & Son,	Cigars,	32	18	..	..	Good.	Dec. 10.	Place automatic traps to elevator,	Complied.
Empire Cigar and Box Factory,	Cigars and cigar boxes,	100	120	..	10	do.	Dec. 10.	Place automatic traps to elevator,	Complied.

EPHRATA, LANCASTER COUNTY, PA.—Continued.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.				Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12.	12 to 16.				
Empire Cigar and Box Factory,	Cigars and cigar boxes,	100	75	. .	15	Fair,	Aug. 17,	Comply with sections 3, 7, 10, and erect fire escape.	
Joseph Cooper,	Cigars,	76	9	. .	2	do.	Aug. 17,	Comply with sections 2, 3 and 10.	
W. W. Killian,	do.	12	8	. .	7	do.	Aug. 17,		
A. W. Mentzer & Son,	do.	32	18	. . . . .		do.	Aug. 17,	Comply with sections 7, 10, and erect fire escape.	

REAMSTOWN, LANCASTER COUNTY, PA.

John G. Root,	Cigars,	27	24	. . . . .	Good,	Dec. 9,			
John G. Root,	do.	45	25	. . . . .	Fair,	Aug. 18,			

AKRON, LANCASTER COUNTY, PA.

C. W. Zwally,	Cigars,	28	12	. . . . .	Bad,	Dec. 11,	Comply with section 10,		Complied.
Akron Steam Cigar Box Factory.	Cigar boxes,	5	10	. . . . .	Good,	Dec. 11,			

ROTHSVILLE, LANCASTER COUNTY, PA.

I. G. Usner,	Cigars,	61	14	Good,	Aug. 15,	Post notice of working hours,		Complied.
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WILLIAMSPORT, PA.

Loyd Laundry and Shirt Co., . . .	Shirts,	10	35	Good,	April 5.		
Wire Buckle Suspender Company, . . .	Suspenders,	25	120	do.	April 5.		
Lycoming Rubber Company, . . .	Rubber boots and shoes, . . .	151	169	. . . . .	do.	April 5.	Put elevator traps in good condition, and erect fire escape.	
L. M. Castner,	Picture frames,	29	7	. . . . .	do.	April 5.	Comply with sections 2, 3, and place railing on stairway.	Complied.
Self Locking Buckle Suspender Company, . . .	Self-locking buckle suspenders,	4	16	. . . . .	do.	April 5.		
Lycoming Pants Company,	Pantaloon,	6	59	. . . . .	do.	April 6.		
Williamsport Kindling Wood Co., . . .	Kindling wood,	78	47	. . . . .	do.	April 6.		
Cornwall Manufacturing Co., . . .	Pants, overalls and shirts, . . .	4	47	. . . . .	do.	April 6.		
Williamsport Candy Manufacturing Company, . . .	Candy,	30	15	. . . . .	do.	April 6.		
Ertel Bros.,	Cigar boxes,	7	26	. . . . .	do.	April 6.	Provide water closets separate and apart, .	Complied.
G. L. Crouse,	Kindling wood,	70	30	. . . . .	do.	April 6.		
Standard Candy Company,	Candy,	13	27	. . . . .	do.	April 7.	Erect fire escape.	
Jenks, Rhoads & Co.,	Shirts and laundry,	2	23	. . . . .	do.	April 7.	Erect fire escape,	Complied.
Baum & Ullman,	Wire buckle suspenders, . . .	5	40	. . . . .	do.	April 7.	Post notice of working hours, and erect fire escape.	Complied.
Fisher & Hinkel Co.,	Biscuits and confectionery, . .	25	20	. . . . .	do.	April 7.	Comply with sections 3, 7, and erect fire escape.	Complied.
Williamsport Furniture Co., . . .	Furniture,	230	. . . . .	. . . . .	do.	April 7.	Comply with section 3, and erect fire escape.	Complied.
Williamsport Nail Company, . . .	Nails,	175	. . . . .	. . . . .	do.	April 7.		
J. E. Dayton & Co.,	Boots and shoes,	65	35	. . . . .	do.	April 7.		
J. J. Crouse,	Kindling wood,	65	35	. . . . .	Fair,	Sept. 22.		
Williamsport Candy Manufacturing Company, . . .	Candy,	30	20	. . . . .	do.	Sept. 22.		
Ertel Bros.,	Cigar boxes,	7	23	. . . . .	Good,	Sept. 22.	Erect fire escape.	
Williamsport Woolen Company, . .	Woolen Goods,	16	14	. . . . .	do.	Sept. 22.	Place railing around floor opening for hoist, also erect fire escape.	

WILLIAMSPORT, PA.—Continued.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.				Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12.	12 to 16.				
Wire Buckle Suspender Company,	Suspenders,	27	135	..	5	Good.	Sept. 23.		
Baum & Ullman,	do.	3	32	..	..	do.	Sept. 23.		
Fisher & Hinkel Co.,	Biscuits and confectionery. .	30	30	..	7	do.	Sept. 23.	Comply with sections 2 and 3,	Complied.
Lycoming Rubber Company,	Rubber boots and shoes,	200	200	..	..	do.	Sept. 23.		
Self-Locking Buckle Suspender Company.	Suspenders,	4	21	..	..	do.	Sept. 23.		
L. M. Castner	Picture and mirror frames, .	23	5	..	5	do.	Sept. 23.		
Lycoming Pants Company,	Pantaloon,	3	47	..	..	do.	Sept. 23.		
J. E. Dayton Company,	Shoes,	80	20	..	3	do.	Oct. 26.		
Royal Braid Company,	Braids,	1	24	..	8	do.	Oct. 26.	Comply with sections 2 and 3,	Complied.
Reliable Knitting Mill,	Hosiery, . . . . .	..	15	..	..	do.	Oct. 26.		
Standard Candy Company,	Candy,	16	47	..	6	do.	Oct. 27.		
Jenks, Rhoads & Co.,	Shirts and laundry,	3	21	..	..	do.	Oct. 27.		
Loyd Shirt Manufacturing Company and Laundry.	do.	10	35	..	..	do.	Oct. 27.	Erect fire escape.	
Cornwall Manufacturing Co., . . .	Overalls and shirts,	5	45	..	..	do.	Oct. 27.		
Williamsport Furniture Co., . . .	Furniture,	300	..	..	25	do.	Oct. 27.		
Williamsport Kindling Wood Co., .	Kindling wood,	80	45	..	10	do.	Oct. 27.		
Williamsport Nail Factory, . . .	Nails,	160	..	..	20	do.	Oct. 27.		

MUNCY, LYCOMING COUNTY, PA.

Muncy Woolen Manufacturing Co.	Woolen blankets,	27	23	2	Good.	Sept. 21.	Comply with sections 2 and 3, guard opening in floor, and box belts.	Complied.
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READING, BERKS COUNTY, PA.

Curtis, Jones & Co.,	Shoes,	50	30	9	Good,	Dec. 14.		
Dives, Pomeroy & Stewart.	Dry goods,	113	65	15	do.	Dec. 14.		
J. S. Shader,	do.	15	11	3	do.	Dec. 14.		
Whisler & Whitman.	Cigars,	20	60	12	do.	Dec. 15.	Comply with section 2,	Complied.
Gem of the Orient Cigar Factory,	do.	14	14	2	do.	Dec. 15.	Comply with sections 2 and 3,	Complied.
Reading Pants Factory,	Pants,	3	10	. . .	do.	Dec. 15.	Place automatic traps to elevator, also erect fire escapes.	Complied.
W. J. Robst & Son.	Hosiery,	1	60	10	do.	Dec. 15.	Place automatic traps to elevator, also erect fire escapes.	Complied.
J. Mould & Co.,	Dry goods,	28	32	4	do.	Dec. 15.		
Eclipse Knitting Works,	Hosiery,	4	19	5	do.	Dec. 15.	Comply with sections 2 and 3.	
Heere & Koch,	Cigars,	70	30	22	do.	Dec. 15.		
G. W. Crouse & Co.,	do.	50	100	13	do.	Dec. 16.		
Hosiery Factory (Nold & Horst),	Hosiery,	10	70	25	do.	Dec. 16.	Comply with sections 2 and 3,	Complied.
Reading Silk Mill,	Brocade silk,	25	225	38	do.	Dec. 16.		
W. W. Stewart,	Cigars,	45	25	4	do.	Dec. 16.	Comply with sections 2 and 3, and designate water closets.	Complied.
Darrah & Co.,	do.	1	47	19	do.	Dec. 16.		
Seamless Hosiery Factory,	Seamless hosiery,	50	140	46	do.	Dec. 16.		
Boyer & Heilig,	Cigar boxes,	12	15	5	do.	Dec. 16.		
Fisher & Co.,	Cigars,	1	21	1	do.	Dec. 16.		
Excelsior Steam Box Factory,	Cigar boxes,	30	20	11	do.	Dec. 16.		
Reading Paper Mill,	Paper,	33	22	1	do.	Dec. 17.		
C. W. Hendel,	Hats,	75	50	1	do.	Dec. 17.		

READING—Continued.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.			Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12.	12 to 16.			
Hendel Bros.,	Woolen hats,	75	65	..	30	Dec. 17.		
Reading Cotton Mill,	Cotton goods,	45	230	..	50	Dec. 17.		
Reading Hardware Company,	Builders' hardware,	771	29	..	203	Dec. 17.		
P. Ruff & Co.,	Cigars,	37	38	..	12	Dec. 17.		
Excelsior Steam Laundry,	Laundry,	2	11	..	..	Dec. 17.		
Dilbert Bros.,	Cigars,	40	65	..	15	Dec. 17.		
Yocum Bros.,	do.	95	95	..	4	Dec. 17.		
Geo. C. Frame,	do.	42	31	..	5	Dec. 18.		
Rick Bros.,	Hardware,	130	..	..	30	Dec. 18.		
J. J. Leinback & Co.,	Woolen goods,	34	26	..	21	Dec. 18.		
Reading Knitting Mill,	Hosiery,	10	315	..	39	Dec. 18.		
Glaser, Frume & Co.,	Cigars,	83	94	..	47	Dec. 19.		
Thos. Jackson & Son,	Ropes,	92	49	..	54	Dec. 19.		
T. A. Wilson & Co.,	Steel spectacles,	75	75	..	..	Dec. 19.		
Reading Glass Works,	Bottles,	50	..	..	11	Dec. 19.		
J. G. Mohn & Co.,	Woolen hats,	75	25	..	12	Dec. 21.	Place guard rail on stairway,	Complied.
W. H. Reimohl & Co.,	do.	39	11	..	..	Dec. 21.	Place guard rail on stairway,	Complied.
Monarch Knitting Mill,	Hosiery,	16	39	..	28	Dec. 21.		
John R. Mast & Co.,	Cigars,	14	21	..	4	Dec. 21.		
Louis Weber & Co.,	Hosiery,	9	100	..	21	Dec. 22.		

READING--Continued.

NAME OF FACTORY OR Workshop.	Goods manufactured.	NUMBER EMPLOYED.			Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12.	12 to 16.			
Perre & Koch,	Cigars,	74	47	..	15	Mar. 7,	Comply with sections 2 and 3,	Complied.
Louis Webber & Co.,	Hosiery,	111	125	..	98	Mar. 8,	Comply with sections 7 and 10,	Complied.
Curtis, Jones & Co.,	Shoes,	55	25	..	6	Mar. 8,	..	..
W. W. Stewart,	Cigars,	65	15	..	6	Mar. 9,	Erect fire escape,	Complied.
Thomas Jackson & Son,	Ropes,	64	43	..	37	Mar. 9,	Comply with section 10,	Complied.
Darrah & Co.,	Cigars,	1	47	..	16	Mar. 9,	Erect fire escape.	..
Wisler & Whitman,	do.	18	37	..	7	Mar. 9,	Comply with section 2 and 10.	..
S. Hirschland,	Pantaloons	4	14	..	..	Mar. 9,	..	..
Reading Hardware Company,	Bullder s hardware,	789	36	..	205	Mar. 10,	..	..
Reading Cotton Mill,	Cotton goods	65	200	..	66	Mar. 10,	..	..
Monarch Knitting Mill,	Holsery,	20	28	..	27	Mar. 10,	Comply with section 10,	Complied.
Philip Rufe & Co.,	Cigars,	30	0	..	7	Mar. 10,	Comply with sections 7 and 10 and erect fire escape.	..
H. Engle Paper Box Factory,	Paper boxes	4	24	..	1	Mar. 10,	Comply with sections 2 and 3,	Complied.
R. H. Savage & Co.,	Wood hats	135	40	..	5	Mar. 11,	Comply with section 2 and erect fire escape,	Complied.
Henry B. Hendel & Co.,	do.	70	30	..	1	Mar. 11,	Comply with sections 2, 3 and 10 and erect fire escape.	Complied.
C. F. Kenler & Son,	do.	17	15	..	10	Mar. 11,	Comply with section 2 and 10 and erect fire escape.	..
J. G. Mohn & Bro.,	do.	64	27	..	15	Mar. 11,	Comply with section 10 and erect fire escape,	Complied.
Glaser, Frame & Co.,	Cigars,	89	118	..	37	Mar. 11,	Comply with sections 2 and 10,	Complied.

C. W. Hendel,	Fur hats,	85	50	2	Good,	Mar. 14,	Comply with sections 7 and 10,	Complied.
J. R. Miller & Co.,	Wool hats,	70	35	6	do.	Mar. 14,	Comply with section 10,	Complied.
Hendel Brothers & Son,	do.	85	40	22	do.	Mar. 14,	Comply with section 10,	Complied.
D. F. Lotz & Co.,	do.	27	9	6	do.	Mar. 14,	Comply with section 10,	Complied.
W. W. Reineohl & Co.,	do.	35	10	2	do.	Mar. 14,	Comply with section 10 and erect fire escape,	Complied.
Reading Paper Box Company,	Paper boxes,	3	16	5	do.	Mar. 15,	Comply with sections 2, 3, 7 and 10,	Complied.
Eclipse Knitting Works,	Hosiery,	4	36	4	do.	Mar. 15,	Comply with sections 2 and 3,	Complied.
J. S. Shade,	Dry goods and notions,	14	8	4	do.	Mar. 15,	Comply with section 10 and erect fire escape,	Order revoked for fire escape.
J. Mould & Co.,	Dry goods,	17	20	4	do.	Mar. 15,	Erect fire escape,	Complied.
Dives, Pomeroy & Stewart,	do.	72	64	16	do.	Mar. 15,	Automatic traps to elevator and erect fire escape,	Complied.
Rick Bros.,	Hardware,	130	...	21	do.	Mar. 28,	...	Complied.
Reading Glass Works,	Bottles,	55	...	10	do.	Mar. 28,	...	Complied.
Reading Paper Mills,	Paper,	36	20	...	do.	Mar. 28,	...	Complied.
Packerack Paper Mills,	do.	27	19	...	do.	Mar. 28,	...	Complied.
Pennsylvania Hardware Co.,	Hardware,	350	50	90	do.	Mar. 28,	Erect fire escape,	Complied.
George W. Lehr,	Cigars,	26	14	5	do.	Mar. 29,	Comply with sections 2 and 3,	Complied.
F. S. Wertz & Co.,	Crackers,	33	...	11	do.	Mar. 29,	...	Complied.

WOMELSDORE, BERKS COUNTY, PA.

D. Ruth Knitting Mill,	Hosiery,	1	17	4	Good,	Oct. 12,	Comply with sections 2 and 3,	Complied.
A. S. Valentine & Sons,	Cigars,	85	15	3	do.	Oct. 12,	Comply with sections 2 and 3,	Complied.

KUTZTOWN, BERKS COUNTY, PA.

King Knitting Mill,	Ladies underwear,	5	23	...	Good,	Oct. 11,	Automatic traps to elevator and railing on stairway,	Complied.
Keystone Shoe Manufacturing Co.,	Shoes,	49	36	9	do.	Oct. 11,	...	Complied.

STONY CREEK, BERKS COUNTY, PA.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.					Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12.	12 to 16.					
Stony Creek Mills,	Cotton and woolen goods. . .	42	10	..	7	Good.	Jan. 29.			
Stony Creek Mills,	do.	49	11	..	7	do.	Mar. 29.			

BIRDSBORO, BERKS COUNTY, PA.

Rambo & Regar,	Hosiery,	2	58	..	20	Good.	May 25.	Comply with sections 2 and 3.	Complied.
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BOYERTOWN, BERKS COUNTY, PA.

D. S. Erb & Co.,	Cigars,	80	60	..	18	Fair.	May 31.	Comply with sections 2, 3 and 10, and erect fire-escape.	
U. S. Cigar Factory,	do.	109	100	..	38	do.	May 31.	Comply with sections 2, 3, 7 and 10,	Complied.
Boyertown Hosiery Mills,	Hosiery,	16	17	..	15	Good.	June 1.	Comply with sections 2 and 3,	Complied.

MOHNSVILLE, BERKS COUNTY, PA.

Mohn Hat Company.	Wool hats,	18	7	..	4	Good,	Dec. 24,	Comply with sections 2, 3, 11, 18, and designate water closets.	Complied.
Wyoming Hose Company,	Hosiery,	20	25	..	22	do.	Dec. 24,	Comply with sections 2 and 3,	Complied.
John J. Eshelman,	Cigars,	18	30	3	12	do.	Jan. 28,	Comply with sections 2 and 3,	Complied.
John J. Eshelman,	do.	14	32	..	12	do.	Mar. 30,		
Wyoming Hosiery Company, . . .	Hosiery,	30	35	..	45	do.	Mar. 30,		

SHILLINGTON, BERKS COUNTY, PA.

George Hendel Bros. & Sons, . .	Wool hats,	47	18	..	45	Good,	Jan. 28,		
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ST. LAWRENCE, BERKS COUNTY, PA.

St. Lawrence Woolen Mill,	Woolen goods,	41	13	..	7	Good,	Jan. 29,		
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MAUCH CHUNK, CARBON COUNTY, PA.

Mauch Chunk Shoe Company, . .	Shoes,	50	30	Good,	June 2,		
Ernest Silk Mill,	Silk,	30	150	..	75	do.	June 2,	Comply with section 7 and erect fire escape,	Order revoked for fire escape.

WEATHERLY, CARBON COUNTY, PA.

Weatherly Silk Mill,	Silk throwing,	90	400	..	240	Good	June 3,		
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LEHIGHTON, CARBON COUNTY, PA.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.				Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12.	12 to 16.				
Lehighton Knitting Company, . .	Hosiery,	4	42	..	13	Fair,	Aug. 19,	Comply with sections 2, 3, 10,	Complied.

LOPEZ, SULLIVAN COUNTY, PA.

Lopez Kindling Wood Company, .	Kindling wood,	53	7	..	19	Good,	Sept. 19,	Comply with sections 2 and 3,	Complied.
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LEWISBURG, UNION COUNTY, PA.

Joseph Muner & Sons,	Hosiery and mittens,	2	13	..	2	Good,	Oct. 26,	Comply with sections 2 and 3.	Post notice of working hours and erect fire escape.
Lewisburg Woollen Mill,	Woollen goods,	13	32	do.	Oct. 26,		

NORTHUMBERLAND, NORTHUMBERLAND COUNTY, PA.

Iron Nail Works,	Nails,	160	11	Good,	May 16,	Comply with sections 2 and 3,	Complied.
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WATSONTOWN, NORTHUMBERLAND COUNTY, PA.

Watson town Boot and Shoe Co., .	Boots and shoes,	49	11	..	1	Good.	Sept. 21.	
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MILTON, NORTHUMBERLAND COUNTY, PA.

West Branch Hosiery Company, .	Hosiery,	1	60	..	12	Good.	Sept. 20.	Comply with sections 2 and 3,
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SHAMOKIN, NORTHUMBERLAND COUNTY, PA.

C. F. Helm & Co.,	Wooden door knobs,	4	14	Good.	Sept. 19.	
J. W. Fony & Sons,	Hosiery,	4	81	..	41	do.	Sept. 19.	Comply with sections 2 and 3,

ROYERS FORD, MONTGOMERY COUNTY, PA.

Royers Ford Hosiery Mill,	Hosiery,	36	36	..	9	Good.	May 23.	Erect fire escape.
Enterprise Hosiery Company, . .	Hosiery and underwear, . .	7	38	..	22	do.	May 23.	
Royers Ford Glass Company, . .	Bottles,	175	..	..	20	do.	May 24.	Comply with sections 2 and 3,
Diamond Glass Company,	Glass bottles,	190	..	..	35	do.	May 24.	Comply with sections 2 and 3,
Freemont Hosiery Mill,	Hosiery,	11	22	..	..	do.	May 24.	Comply with section 11,
American Shirt and Hosiery Mill,	Hosiery and underwear, . . .	5	15	..	9	do.	May 24.	Comply with sections 2 and 3, and erect fire escape.

POTTSTOWN, MONTGOMERY COUNTY, PA.

Norristown Hosiery Company, . .	Hosiery,	3	55	..	21	Good.	May 25.	
Bachelor Bros.,	Cigars,	21	36	..	3	do.	May 25.	Erect fire escape and comply with section 2.
D. K. Engel,	do. . . . .	..	19	..	4	Fair.	May 25.	Comply with sections 2 and 3,

Provide water closets separate and apart, guard belting and place railing on stairway.

Complied.

Royal Knitting Mill,	do.	do.	do.	do.	16	5	do.	April 1.	Complied.
H. Berger & Son,	Hosiery,	do.	do.	do.	45	6	do.	April 1.	Complied.
Berger, Brown & Co.,	Shoes,	do.	do.	do.	10	26	do.	Sept. 15.	Complied.
Eagle Underwear Mill,	Ladies' knit goods,	do.	do.	do.	15	2	do.	Sept. 15.	Complied.
Royal Knitting Mill,	Ladies' underwear,	do.	do.	do.	19	5	do.	Sept. 15.	Complied.
Standard Hosiery Mill,	Hosiery,	do.	do.	do.	43	3	do.	Sept. 15.	Complied.
Enterprise Knitting Mill,	Ladies' knit goods,	do.	do.	do.	16	1	do.	Sept. 15.	Complied.
Spring Garden Hosiery Mill,	Hosiery,	do.	do.	do.	55	5	do.	Sept. 15.	Complied.

TOWER CITY, SCHUYLKILL COUNTY, PA.

Tower City Mill,	Hosiery,	1	13	3	Good,	Oct. 25,	Comply with sections 2 and 3, and have water closets separate and apart.
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ORWIGSBURG, SCHUYLKILL COUNTY, PA.

Schoener & Co.,	Shoes,	25	15	1	Good,	Mar. 31,	Comply with section 10,	Complied.
Orwigsburg Shoe Manufacturing Company,	do.	28	25	7	do.	Mar. 31.	Comply with section 2 and have water closets separate and apart.	Complied.
H. S. Albright & Co.,	do.	29	26	6	do.	Mar. 31,	Comply with sections 2 and 3,	Complied.
Folmer Shoe Company,	do.	31	23	7	do.	Mar. 31.	Comply with sections 2 and 3,	Complied.
A. E. Brown & Co.,	do.	46	27	8	do.	Mar. 31.	Comply with sections 2 and 3,	Complied.
Kepner, Scott & Co.,	do.	32	18	4	do.	Mar. 31,	Erect fire escape.	Complied.
Shoener & Co.,	do.	20	15	4	do.	Sept. 16,	Comply with sections 2 and 3,	Complied.
H. S. Albright & Co.,	do.	33	27	4	do.	Sept. 16.	Comply with sections 2 and 3,	Complied.
Orwigsburg Shoe Company,	do.	55	20	10	do.	Sept. 16.	Comply with sections 2 and 3,	Complied.

ORWIGSBURG, SCHUYLKILL COUNTY, PA.—Continued.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.				Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12.	12 to 16.				
Folmer Ice Company.	Shoes,	41	21	..	6	Good,	Sept. 16.		
Eisenhuth & Miller,	do.	13	11	..	4	do.	Sept. 16.	Comply with sections 2 and 3, and have water closets separate and apart.	
Kepner, Scott & Co.,	do.	28	15	..	4	do.	Sept. 16.		
A. E. Brown & Co.,	do.	45	29	..	5	do.	Sept. 16.		

POTTSVILLE, SCHUYLKILL COUNTY, PA.

Tilt Silk Mill,	Silk throwing and weaving,	200	300	..	200	Good,	Mar. 24.		
Pottsville Knitting Mill,	Hosiery,	1	44	..	14	do.	Mar. 24.	Comply with sections 2 and 3,	Complied.
Tilt Silk Mill,	Silk,	190	330	..	140	do.	Sept. 14.	Erect fire escape.	
Pottsville Knitting Mill,	Hosiery,	1	34	..	9	do.	Sept. 14.		

ST. CLAIR, SCHUYLKILL COUNTY, PA.

Miners' Supply Company,	Miners' squibs,	2	68	..	4	Good,	Mar. 24.	Comply with sections 2 and 3,	Complied.
American Miners' Squib Factory,	do.	1	52	..	2	do.	Mar. 24.	Comply with sections 2 and 3,	Complied.
George Hayes,	do.	1	49	..	4	Fair,	Sept. 14.		
Miners' Supply Company,	do.	3	67	..	6	Good.	Sept. 14.		

MAHANoy CITY, SCHUYLKILL COUNTY, PA.

Eagle Hosiery Mill,	Hosiery,	6	94	13	Good.	Mar. 22.	Comply with sections 2 and 3,	Complied.
Eagle Hosiery Mill,	do.	6	109	35	do.	Sept. 13.		

TAMAQUA, SCHUYLKILL COUNTY, PA.

Tamaqua Knitting Mills,	Hosiery,	25	90	49	Good.	Mar. 23.	Comply with sections 2 and 3 and erect fire escape.	Complied.
Tamaqua Boot and Shoe Company,	Boots and shoes,	44	15	5	do.	Mar. 23.		
Tamaqua Boot and Shoe Company,	do.	35	15	6	Fair.	Sept. 13.	Provide water closets separate and apart, .	Complied.
Tamaqua Knitting Mill,	Hosiery,	18	80	46	Good.	Sept. 13.		

HANOVER, YORK COUNTY, PA.

S. H. Bechtel & Son,	Cigar boxes and hosiery,	5	15	15	Good.	Feb. 19.	Water closets separate and apart, and provide wash rooms for females.	Complied.
H. A. Bair,	Cigar boxes,	8	8	15	do.	Feb. 19.	Comply with section 10,	Complied.
Hanover Shoe Company,	Shoes,	30	30	15	do.	Feb. 19.	Comply with section 10,	Complied.
Hanover Cordage Company,	Binding twine,	15	15	3	do.	Feb. 19.		
Jesse Frysinger,	Cigars,	35	26	15	do.	Feb. 19.	Comply with section 10,	Complied.
Jesse Frysinger,	do.	33	18	15	Fair.	Aug. 30.		
Hanover Shoe Company,	Shoes,	42	23	2	Good.	Aug. 30.		
L. G. Pfaff,	Cigars,	28	10	15	Fair.	Aug. 30.		
Hanover Caramel Company,	Candy,	11	16	7	do.	Aug. 30.	Comply with sections 2 and 3, automatic trap to elevator and erect fire escape.	
E. E. Myers & Co.,	Cigars,	31	19	1	do.	Aug. 30.	Comply with sections 2, 3 and 7.	

EAST PROSPECT, YORK COUNTY, PA.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.				Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12.	12 to 16.				
E. J. Siller,	Cigars,	32	9	..	2	Bad.	Sept. 1.	Comply with section 2 and place water closets in clean condition.	

WRIGHTSVILLE, YORK COUNTY, PA.

J. Kline,	Cigars,	14	29	..	3	Good.	Feb. 18,	Comply with section 10,	Complied.
D. S. Detwiler,	do.	51	30	..	7	do.	Feb. 18,	Comply with sections 2 and 10,	Complied.
S. R. Koeber,	do.	16	19	..	3	do.	Feb. 18,	Comply with sections 2 and 10,	Complied.
Gray and Kagle Shoe Company,	Shoes,	31	22	..	3	do.	Feb. 18,	Comply with sections 2, 3 and 10,	Factory closed.
D. S. Detwiler,	Cigars,	25	25	..	5	do.	Oct. 20,	Erect fire escape.	
S. R. Koeber,	do.	16	17	..	3	do.	Oct. 20,	Erect fire escape.	
Jacob Kline,	do.	5	22	..	3	do.	Oct. 20,	Erect fire escape.	

YORKANA, YORK COUNTY, PA.

J. W. Horn,	Cigars,	19	13	..	3	Bad.	Sept. 1.	Comply with sections 1, 2 and 3, and place water closets in good condition, guard stairway with proper railing.	Complied.
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DALLASTOWN, YORK COUNTY, PA.

Pioneer Cigar Box Factory, . . .	Cigar boxes.	7	14	1	Bad,	Sept. 1.	Comply with section 2. place water closet in good condition, separate and apart, and place guard rails on stairway.	Complied.
Empire Cigar Factory,	Cigars,	22	9	1	do.	Sept. 1.	Comply with sections 2 and 3, water closets separate and apart and put the same in a clean condition.	Complied.
F. Kohler & Co.,	Cigar boxes,	11	14	2	do.	Sept. 1.	Comply with sections 2 and 3, screen and place water closets in a clean condition.	

YORK HAVEN, YORK COUNTY, PA.

York Haven Paper Company, . .	Paper and pulp.	111	14	. . .	Good,	Aug. 25,	Comply with sections 1, 2 and 3.	
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SPRING GROVE, YORK COUNTY, PA.

P. H. Gladfelter	Paper,	102	35	. .	Good,	Aug. 26,	Comply with sections 1 and 3.	Complied.
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YORK, YORK COUNTY, PA.

Meyers & Adams,	Cigars,	116	14	24	Good,	July 28,	Comply with sections 2, 3 and 7 and erect fire escape.	
Standard Cigar Factory,	Cigars and cigar boxes, . . .	45	20	11	do.	July 28,	Automatic traps to elevator, water closets separate and apart.	
J. K. Pfalzgraff & Co.,	Cigars,	20	6	5	Fair,	July 28,	Comply with sections 2 and 3 and have water closet separate and apart.	Complied.
S. S. Gable,	do.	20	50	12	do.	July 28,	Automatic traps to elevator and erect fire escape.	
P. C. Fulwiler & Bros.,	do.	16	21	8	Bad,	July 29,	Place water closets in a sanitary condition and erect fire escape.	
York Wire Cloth Company, . . .	Wire cloth,	15	37	. . .	Good,	July 29,	Water closets separate and apart and erect fire escape.	Fire escape erected.
York Match Company,	Matches,					July 30,	Erect fire escape.	

YORK, YORK COUNTY—Continued.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.				Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12.	12 to 16.				
P. C. Weist & Co.,	Candy,	100	300	..	49	Good,	July 30,	Comply with section 3 and erect fire escape,	Complied.
Lejeau Manufacturing Company,	do.	5	27	..	4	do.	Aug. 1.	Comply with sections 2, 3 and 7 and have water closets separate and apart.	Complied.
Aeme Candy Company,	do.	5	20	..	8	Fair,	Aug. 1.	Comply with sections 2, 3 and 7 and erect fire escape and place guard rail on stairway.	
York Paper Box Company,	Paper boxes,	4	11	..	2	do.	Aug. 1.	Comply with sections 2, 3 and 7 and erect fire escape.	
Paragon Cigar Manufacturing Co.,	Cigars,	39	44	..	15	Good,	Aug. 1.	Comply with section 2 and erect fire escape.	
Schrivver & Pfeiffer	do.	15	29	..	3	Fair,	Aug. 1.	Automatic traps to elevator, water closets separate and apart.	
Holtzman Manufacturing Co.,	Ladies' underwear.	3	83	..	12	Bad,	Aug. 1.	Comply with sections 2, 3 and 7 and erect fire escape. Have water closets separate and apart and place same in clean condition.	
Codorus Candy Company,	Candy,	15	35	..	9	Fair,	Aug. 2.	Comply with sections 2, 3 and 7 and have water closets separate and apart.	
H. W. Hefner,	Cigar boxes,	37	33	..	8	Good,	Aug. 2.	Automatic traps to elevator. Closets separate and apart.	Complied.
E. Myers,	do.	8	10	..	...	Fair,	Aug. 2.	Water closets separate and apart and erect fire escape.	
F. E. Myers,	Cigars,	2	13	..	...	do.	Aug. 2.	Have water closets separate and apart.	Complied.
A. K. Baylor,	do.	28	29	..	5	do.	Aug. 2.	Automatic traps to elevator and erect fire escape.	Complied.
C. A. Baylor,	do.	15	48	..	9	Good,	Aug. 9.		Complied.

LOCK HAVEN, CLINTON COUNTY, PA.

J. H. Harmon,	Cigars,	19	20	2	Good,	April 8,	Provide water closets separate and apart erect fire escape.	Complied.
New York and Pennsylvania Co.,	Pulp paper,	134	26	. . .	do.	April 8,		
New York and Pennsylvania Co.,	do.	130	30	. . .	do.	Oct. 28,		

TOWANDA, BRADFORD COUNTY, PA.

Wm. H. Godcharles,	Nails,	125	. . .	16	Good,	April 29,	Comply with sections 2, 3 and 8,	Complied.
Towanda Nail Factory,	do.	130	. . .	13	F air,	Sept. 7,	Place automatic shifters on nail machine.	
J. H. Hawes Manufacturing Co.,	Toys,	145	55	34	Good.	Sept. 7,	Comply with sections 2 and 3,	Complied.
Humphries Bros. & Tracy,	Boots and shoes,	65	10	. . .	do.	Sept. 7,	Comply with section 3 and erect fire escape.	

McSHERRYSTOWN, ADAMS COUNTY, PA.

Imperial Cigar Factory,	Cigars,	25	22	. . .	Bad,	Aug. 31,	Place water closets in clean condition. . .	Complied.
F. X. Smith,	do.	26	19	. . .	do.	Aug. 31,	Place water closets in clean condition. . .	Complied.
Chas. H. Busby,	do.	24	39	4	do.	Aug. 31,	Comply with sections 2 and 3, and place water closets in clean condition.	Complied.
S. L. Johnson,	do.	78	65	6	do.	Aug. 31,	Comply with sections 2 and 3, and place water closets in clean condition, and have automatic traps put on elevator.	Complied.
Connowago Cigar Box Co.,	Cigar boxes,	7	14	2	do.	Aug. 31,	Keep record book. Guard stairway, . . .	Complied.
J. A. Polst & Co.,	Cigars,	35	20	4	do.	Aug. 31,	Comply with section 3, automatic traps to elevator and place water closets in clean condition.	Complied.

HONESDALE, WAYNE COUNTY, PA.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.			Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12. 12 to 16.				
Dexter, Lambert & Co.,	Silk,	53	140	66	Good.	May 3.		
Durland, Thompson & Co., . . .	Boots and shoes,	102	33	...	Fair.	May 3.	Comply with section 3 and have water closets separate and apart,	Complied.
Honesdale Shoe Company,	Shoes,	30	18	...	Good.	May 3.	Comply with section 3,	Complied.
N. A. Ray (Decorative Works), . .	Decorating glassware,	5	23	...	Fair.	May 3.	Comply with section 3 and provide water closets separate and apart.	Complied.
T. B. Clark & Co.,	Glass cutting,	100	3	9	Good.	May 4.	Comply with sections 2, 3 and 11,	Exempt.
N. A. Ray (Decorative Works), .	Decorating glassware,	5	15	...	do.	Nov. 10.		
Honesdale Shoe Company,	Shoes,	34	21	...	do.	Nov. 10.		
Durland, Thompson & Co., . . .	do.	102	35	...	do.	Nov. 10.	Erect fire escape.	
Dexter, Lambert & Co.,	Silk throwing and weaving, . .	65	160	55	do.	Nov. 10.		

SEELYVILLE, WAYNE COUNTY, PA.

Purdy & Robinson,	Shirts and pants,	2	24	...	Good.	May 4.	Post legal notice of working hours,	Complied.
Seelyville Woollen Mill,	Woollen goods,	18	23	...	do.	May 4.	Post legal notice of working hours and erect fire escape.	Complied.
Seelyville Woollen Mill,	do.	20	25	...	do.	Nov. 9.	Erect fire escape.	
Purdy & Robinson,	Clothing, . . . . .	...	13	...	do.	Nov. 9.		

WHITE MILLS, WAYNE COUNTY, PA.

C. Dorflinger & Son's,	Glass,	319	27	26	Good.	May 5.	Comply with section 11,	Complied.
C. Dorflinger & Son's,	do.	350	25	49	do.	Nov. 11.		

HAWLEY, WAYNE COUNTY, PA.

Dexter Lambert & Co.,	Silk,	54	246	135	Good.	May 5.	Erect fire escape.	Complied.
Hawley Glass Company,	Bottles,	198	. . . . .	33	do.	May 6.		
Dexter Lambert & Co.,	Silk,	90	210	80	do.	Nov. 11.		
Hawley Glass Company,	Bottles,	160	. . . . .	17	do.	Nov. 11.		

CHAMBERSBURG, FRANKLIN COUNTY, PA.

Chambersburg Shoe Manufacturing Company.	Shoes,	25	25	. . . . .	Good.	Feb. 11.	Comply with sections 3, 7 and 18,	Complied.
Chambersburg Hosiery Company.	Hosiery,	7	38	. . . . .	Fair.	Feb. 11.	Comply with sections 3, 7 and 10,	Complied.
Chambersburg Woolen Company.	Woolen goods,	85	15	. . . . .	do.	Feb. 11.	Comply with sections 2, 3, 7, 10 and 18,	Complied.
Chambersburg Hosiery Company.	Hosiery,	4	36	. . . . .	Good.	Oct. 6.		
Chambersburg Shoe Manufacturing Company.	Shoes,	36	24	. . . . .	do.	Oct. 6.		
Chambersburg Woolen Company.	Woolen goods,	55	13	. . . . .	do.	Oct. 6.	Erect fire escape.	

MT. HOLLY, CUMBERLAND COUNTY, PA.

W. A. & A. T. Mullen,	Printing paper,	18	17	. . . . .	Fair.	Oct. 7.		
Mt. Holly Paper Co., No. 2,	do.	35	39	. . . . .	Good.	Oct. 7.		
Mt. Holly Paper Co., No. 1,	do.	46	29	. . . . .	do.	Oct. 7.		

CARLISLE, CUMBERLAND COUNTY, PA.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.				Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12.	12 to 16.				
The Linden Shoe Company, . . .	Shoes,	32	28	..	...	Good,	Feb. 9.		
Bedford Shoe Company,	do.	25	25	..	4	do.	Feb. 9.	Provide wash room for females,	Order with-drawn.
Carlisle Paper Box Company, . .	Paper boxes,	6	15	..	1	Fair.	Feb. 9.	Comply with sections 7, 10 and 11,	Complied.
G. F. McIntire & Co.,	Clothing,	8	20	..	1	do.	Feb. 9.	Comply with sections 2, 3, 10, 11 and 18, . .	Complied.
Carlisle Silk Company,	Silk throwing,	9	29	..	8	do.	Feb. 9.	Comply with sections 2, 3, 10, 11 and 18, . .	Complied.
G. W. Neldich & Co.,	Shoes,	120	130	..	...	do	Feb. 9.	Comply with sections 4, 10 and 18,	Complied.
Carlisle Silk Company,	Silk throwing,	21	34	..	9	Good.	Oct. 4.		
Bedford Shoe Company,	Shoes,	34	36	..	...	do.	Oct. 4.		
Carlisle Paper Box Company, . .	Paper boxes,	4	16	..	5	do.	Oct. 4.	Comply with sections 2 and 3,	Complied.
Carlisle Clothing Company, . . .	Clothing,	9	21	..	...	do.	Oct. 4.		
Carlisle Shoe Factory,	Shoes,	130	70	..	...	do.	Oct. 4.	Erect fire escape.	
The Linden Shoe Company, . . .	do.	58	42	..	...	do.	Oct. 4.		

MECHANICSBURG, CUMBERLAND COUNTY, PA.

Huston Net Company,	Fly nets,	24	38	9	Bad,	Feb. 8,	Comply with section 10.	Complied.
J. W. Ringrove Manufacturing Company.	do.	90	40	11	do.	Feb. 8.	Comply with section 7 and 10,	Complied.
Huston Net Company,	do.	7	4	4	Good.	Oct. 3.		

SHIPPENSBURG, CUMBERLAND COUNTY, PA.

Shippensburg Hosiery Mill, . . .	Seamless hosiery.	4	24	6	Bad,	Feb. 10,	Comply with section 10.	Complied.
Shippensburg Manufacturing Co.,	Clothing.	11	50	1	do.	Feb. 10,	Comply with sections 2, 3, 10 and 18,	Complied.
W. A. Lutz & Co.,	Pantaloon and overalls, . .	17	34	. . .	do.	Feb. 10.	Comply with sections 3 and 10,	Complied.
Shippensburg Manufacturing Co.,	Clothing.	16	54	2	Good,	Oct. 5,	Erect stairway.	
W. A. Lutz & Co.,	Pants and overalls,	15	48	. . .	do.	Oct. 5.		
Shippensburg Hosiery Company,	Hosiery,	4	23	. . .	do.	Oct. 5.		

NEWVILLE, CUMBERLAND COUNTY, PA.

Newville Knitting Mill,	Hosiery,	19	59	20	Bad,	Feb. 10,	Comply with section 10.	Complied.
Newville Knitting Mill.	do.	13	62	18	Good,	Oct. 5.		

NEW CUMBERLAND, CUMBERLAND COUNTY, PA.

Susquehanna Woolen Mill,	Blankets,	24	16	1	Fair,	Aug. 25.	Comply with sections 1, 2, 3 10, and erect fire escape.	Complied.
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LEBANON, LEBANON COUNTY, PA.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.				Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12.	12 to 16.				
Lebanon Industrial Works.	Handkerchiefs and shirts, . .	25	325	..	39	Good.	Feb. 12.		
Jos. J. Uppenhelmer,	Shirts,	1	15	..	5	Fair.	Feb. 15.	Comply with sections 3, 10, 18,	Complied.
Rauch Bros.,	do.	2	40	..	2	do.	Feb. 15.	Comply with sections 2 and 10,	Complied.
J. Warren Light,	do.	7	13	..	..	Good.	Feb. 15.	Comply with sections 3, 7, 10, 18.	
F. B. Long,	Cigars,	40	20	..	7	Fair.	Feb. 16.	Comply with section 10.	
D. B. Long,	do.	49	20	..	3	do.	Feb. 16.	Comply with section 10,	Complied.
Hauer Bros.,	do.	60	20	1	6	Good.	Feb. 16.	Comply with sections 2, 3, 7 and designate water closets and erect fire escape.	Complied.
W. J. Swope,	do.	13	7	..	7	do.	Feb. 16.	Comply with sections 2, 3 and designate water closets.	Complied.
A. P. Swope,	do.	24	12	..	..	do.	Feb. 16.	Have water closets separate and apart and provide wash rooms for females.	Complied.
Enterprise Shoe Manufacturing Company,	Shoes,	30	20	..	2	do.	Feb. 16.	Comply with sections 2 and 3,	Complied.
Industrial Works,	Handkerchiefs and shirts, . .	200	550	..	125	do.	Oct. 13.		
Pennsylvania Bolt and Nut Co.,	Bolts, nuts and bar iron, . .	1,025	..	..	30	Fair.	Oct. 13.		
Enterprise Shoe Manufacturing Company,	Shoes,	30	20	..	2	Good.	Oct. 13.	Erect fire escape.	
F. B. Long,	Cigars,	36	19	..	9	do.	Oct. 14.		
D. B. Long,	do.	32	18	..	4	do.	Oct. 14.		
Bachman, Long & Co.,	do.	55	20	..	6	do.	Oct. 14.	Comply with sections 2 and 3.	
Rauch & Bros.,	Shirts,	2	34	..	2	do.	Oct. 14.	Erect fire escape.	

J. J. Uppenheimer,	do.	6	30	..	6	do.	Oct. 14.	Erect fire escape.	
Hauer Bros.,	Cigars,	80	15	..	5	do.	Oct. 14.		
A. P. Swope,	do.	20	10	..	..	do.	Oct. 15.		

MYERSTOWN, LEBANON COUNTY, PA.

Acme Shirt Factory,	Shirts and waists,	3	27	..	..	Fair,	Oct. 12.	Comply with sections 2, 3, and have water closets separate and apart.	
Myerstown Industrial Works. . .	Pants,	1	19	..	3	do.	Oct. 12.	Comply with sections 2, 3, and have water closets separate and apart.	Complied.
Eagle Knitting Works,	Hosiery,	3	22	..	4	Good,	Oct. 12.	Comply with section 2 and 3.	

PALMYRA, LEBANON COUNTY, PA.

Palmyra Shoe Manufacturing Co.,	Shoes,	30	16	..	5	Good,	Oct. 15.		
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ANNVILLE, LEBANON COUNTY, PA.

Daisy Shirt Company,	Shirts,	3	28	..	1	Good,	Feb. 17,	Comply with sections 2, 3, 10 and 18,	Complied.
Daisy Shirt Company,	do.	3	37	..	1	do.	Oct. 15.		

ACCIDENT REPORTS OF MISS MARY O'REILLY.—FIRST DISTRICT.
PHILADELPHIA, PA.

Date of accident.	PERSON INJURED.	Age.	Establishment in which accident occurred.	Location.	Machine, etc., on which accident occurred.	Particulars and extent of injury.
1892.						
Jan. 22,	Philip Magill, . . .	14	Schlichter Jute Cordage Co., . .	Philadelphia,	Former machine,	Carelessness; loss of second finger at second joint, right hand.
Feb. 13,	William Ogle, . . .	18	S. A. Rudolph,	Lower Merion, Montgomery county.	Paper machine,	Caught between calenders; lost two joints of middle finger.
March 18,	Martin Keedam, . .	15	J. T. Lewis & Co.,	Chester, Pa., . . . . .	. . . . .	While playing on stairway was accidentally cut on head by a nail.
June 24,	Howard Graul, . . .	16	J. Ellwood Lee Company,	Conshohocken,	Circular saw,	Sawing up sticks and in some manner fingers slipped on saw; thumb and two fingers taken off.
July 29,	Wilmer Thompson,	20	Samuel Riddle's Sons,	Glen Riddle,	Rag picker,	Came in contact with cylinder while in motion; flesh torn from forearm.
Oct. 31,	James Gallagher, .	15	Simeon Cotton,	Chester, Pa.,	Gearing of carding engine, .	While investigating the cause of his engine having stopped; end of right index finger mashed.

REPORTS OF MARY O'REILLY.—FIRST DISTRICT.—1892.

PHILADELPHIA, PA.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.			Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12. 12 to 16.				
John Boggs,	Carpets,	25	45	..	Good,	Dec. 2,	Comply with sections 3 and 12.	Complied.
Glaziers' Hosiery Mill,	Hosiery,	33	65	6	do.	Dec. 2,	Comply with sections 2, 7, 10 and 11.	Complied.
Thomas Boggs,	Carpets,	65	60	1	do.	Dec. 3,	Comply with sections 7, 10 and 12.	Complied.
Keegan Manufacturing Company,	Ginghams,	6	43	1	do.	Dec. 3,	Comply with sections 2, 3 and 10.	Complied.
Star and Crescent Mills Company,	Turkish towels, &c.,	75	75	2	do.	Dec. 7,		
Hoyle, Harrison & Kaye,	Carpets and chenille curtains,	250	250	182	do.	Dec. 7,		
Lykes Rag Sorting Establishment,	Rag sorting,	3	16	..	do.	Dec. 9,	Repair stairway, also make way to fire escape.	Complied.
Levi Tailoring Establishment,	Tailoring,	10	10	..	do.	Dec. 9,	Post notices, also curtain a portion of work-room.	Complied.
Samuel Milder,	do.	5	15	..	do.	Dec. 9,		
Shute's Laundry,	Laundry,	3	11	..	do.	Dec. 9,	Comply with sections 3, 12 and 18.	
Brison Manufacturing Company,	Cotton fabrics,	10	10	2	do.	Dec. 10,		
Jenner's Laundry,	Laundry,	10	20	2	do.	Dec. 10,		
John C. Watt,	Cotton fabrics,	20	30	4	do.	Dec. 10,	Comply with sections 2 and 3.	Complied.
Victoria Mills,	Textile fabrics,	30	100	18	do.	Dec. 15,	Provide wash rooms for females.	Complied.
Southwark Woolen Mills,	Woolen goods,	350	200	8	do.	Dec. 16,	Comply with sections 7 and 12.	Complied.
Wolfenden, Shore & Co.,	do.	145	125	34	Fair,	Dec. 18,	Comply with sections 7 and 10.	Complied.
Sellers & Kaufman,	Textile fabrics,	30	20	5	Good,	Dec. 18,		

PHILADELPHIA, PA.—Continued.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.			Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12.	12 to 16.			
H. S. Henry Flannel Mills, . . .	Flannel,	75	200	..	16	Dec. 18.		
George Callaghan's Estate, . . .	Cotton yarns,	29	86	..	31	Dec. 18.	Comply with sections 8 and 12,	Complied.
Hoyle, Harrison & Kaye,	Carpets and chenille curtains,	250	250	..	182	Dec. 28.	Comply with sections 7 and 10.	
							Comply with section 7, and change location of fire escape.	Complied.
Callaghan Bros.,	Cotton and woolen goods, . .	84	165	..	18	Dec. 28.	Comply with sections 7, 10 and 12,	Complied.
Victoria Mills,	Textile fabrics,	30	100	..	18	Dec. 29.		
National Publishing Company, . .	Publishing and printing, . .	173	131	..	9	Dec. 29.		
Cunwell & Washburn,	Printing wall paper,	80	..	..	15	Dec. 31.		
James Connolly & Sons,	Cotton cloth,	20	60	..	..	Jan. 4.	Comply with section 10 in every particular,	Complied.
Eickhoff & Kramer,	Book bindery,	8	12	..	..	Jan. 4.	Comply with sections 3, 11, and designate water closets.	Complied.
Montgomery Mills,	Carpets,	89	41	..	2	Jan. 5.	Gates to elevator; provide wash rooms on each floor, also replace cable on south end elevator.	Complied.
Reading Screw Company,	Screws,	38	18	..	22	Jan. 5.		
Edward C. Read,	Carpet,	22	13	..	..	Jan. 6.	Orders pending for section 10 and fire escape.	
Allen Manufacturing Company, . .	Woolen yarns,	16	7	..	3	Jan. 6.	Orders pending for sections 7, 10 and fire escape.	
Lockhart Manufacturing Co., . . .	Carpets,	15	25	..	1	Jan. 6.	Orders pending for elevator gates, fire escape and sanitary arrangements.	
J. Wesley Johnson,	do.	12	18	..	2	Jan. 6.		

J. Wood & Ward Manufacturing Company.	Turkish cloths,	20	90	do.	Jan.	6.	Orders pending for fire escape.
Deron Carpet Factory,	Carpets,	27	13	do.	Jan.	6.	
Sullivan Hosiery Manufacturing Company.	Hosiery,	48	102	do.	Jan.	7.	
Model Mills (Thomas Boggs), . .	Carpets,	60	90	1	Jan.	7.	Comply with sections 10 and 12,
Model Mills (J. L. Boggs), . . .	do.	65	60	do.	Jan.	7.	Complied.
Model Mills (William Keegan), . .	Cotton cloths,	18	30	1	Jan.	7.	Comply with sections 10 and 12,
John Campbell Manufacturing Company.	Fine yarns,	200	400	165	Jan.	8.	Complied.
Howell Bros.,	Printing wall paper,	186	..	69	Jan.	13.	Comply with section 2,
Bailey Cordage Works,	Rope, twine, etc.,	125	500	16	Jan.	13.	Comply with sections 3, 7, 8, 10 and 11.
Hackenburg Silk Company,	Silk,	16	113	..	Jan.	15.	Complied.
Historical Publishing Company, . .	Printing and publishing, . . .	40	48	1	Jan.	15.	Comply with section 7,
Croft & Allen,	Confectionery and cocoa, . . .	88	141	6	Jan.	15.	Complied.
Jno. D. Avila,	Printing and publishing, . . .	113	52	..	Jan.	15.	Comply with sections 2, 3, 7 and 10,
Wm. Allen, *	Woolen yarns,	23	7	3	Jan.	18.	Complied.
Wm. Lockhart, *	Carpet,	15	25	1	Jan.	18.	Comply with sections 7, 10 and 12.
Edward C. Read, *	do.	22	13	..	Jan.	18.	Comply with sections 7, 10 and 12.
J. Wesley Johnson, *	do.	12	18	2	Jan.	18.	Comply with sections 7, 10 and 12.
S. Wood & Ward, *	Turkish towels, etc.,	20	90	..	Jan.	18.	Comply with sections 7, 10 and 12.
Chas. P. Cochrane, *	Carpet,	27	13	..	Jan.	18.	Comply with sections 7, 10 and 12.
Tracy Worsted Company,	Worsted yarns,	100	275	40	Jan.	25.	Comply with sections 7, 10 and 12,
McLaughlin Bros. Co.,	Printing,	49	6	4	Feb.	1.	Complied.
Oldach & Co.,	Book binding,	8	14	..	Feb.	1.	Comply with section 2,
National Publishing Company, . .	Printing and publishing, . . .	98	89	9	Feb.	2.	Comply with section 7 and erect fire escape,
John Williams,	Woolen fabrics,	55	70	20	Feb.	2.	Complied.
Jacob Miller Son's & Co.,	Cotton fabrics,	22	40	1	Feb.	3.	Comply with sections 2 and 3,
Stewart Bros. & Co.,	Cotton goods,	6	50	1	Feb.	3.	Comply with sections 10 and 12,

* Tbos. Taylor owner of these mills.

PHILADELPHIA, PA.—Continued.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.			Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12. 12 to 16.				
Coquanock Mills.....	Woolen goods.	5	103	..	Good.	Feb. 4.	Comply with sections 2, 3 and 12.	Complied.
Arlington Manufacturing Co., ..	Ginghams,	10	30	..	do.	Feb. 5.		
David Greer,	Worsted goods,	40	60	..	do.	Feb. 5.		
Warner Bros. Carpet Company. .	Carpets,	375	125	..	Fair,	Feb. 12.	Comply with sections 2, 3, 7, 10 and 12.	Complied.
Stinson Bros.,	do.	315	175	..	do.	Feb. 13.	Comply with sections 2, 3, 7 and 10.	Complied.
Ayers' Manufacturing Company, .	Horse blankets	225	175	..	Good,	Feb. 19.	Comply with sections 1, 2 and 7.	Complied.
Spreckel's Cooperage,	Barrels,	400	..	..	do.	Mar. 3.		
Middlesex Knitting Company, ..	Hosiery,	10	55	..	do.	Mar. 8.	Comply with sections 2 and 10.	Complied.
Keefer & Coon,	Carpets,	58	54	..	Fair,	Mar. 8.	Comply with sections 2, 3, 7 and 10.	Complied.
Orlana Mills,	do.	55	45	..	Good,	Mar. 9.		
Star and Crescent Mills Company.	Turkish towels, etc.,	70	70	..	do.	Mar. 10.	Provide ladder from 2d story so adjusted as to communicate with the ground.	Complied.
Harrison's Chemicals,	Chemicals,	372	28	..	do.	Mar. 16.		
Thos. Bucks & Co.,	Hosiery,	35	60	..	do.	Mar. 17.	Comply with section 10 in every detail.	Complied.
E. M. Woodward, *	Cotton fabrics,	27	13	..	Fair,	Mar. 18.	Comply with section 10 in every detail.	
Dickey & McMaster, *	Carpets,	33	11	..	do.	Mar. 18.	Comply with section 10 in every detail.	
Victoria Carpet Mills, *	do.	40	50	..	do.	Mar. 18.	Comply with section 10 in every detail.	
Samuel Milder,	Tailoring,	5	20	..	do.	Mar. 21.		
Thomas Sykes,	Rag sorting,	5	10	..	do.	Mar. 21.		

* Thos. Derlin & Sons owners of these mills.

Star Novelty Company,	4	102	do.	Mar. 21,	Provide additional water closet basin, . . .	Complied.
Continental Worsted Company, . .	200	350	123	Mar. 22.		
Ivins, Dietz & Magee,	185	185	20	Mar. 26.		
Can Factory, Atlantic Refinery Co.	340	340	83	May 4.		
Jno. T. Bailey Cordage Company,	170	350	38	May 5.	Comply with section 7 and 10, fire escape, red light in hallway during the night, bong or alarm to be used in case of fire and to be kept easy of access.	
Southwark Manufacturing Co., *	51	14	2	May 6.		
Devon Carpet Manufacturing Co.*	33	10	1	May 17.		
Wood & Ward, *	20	75	...	May 17.		
Wm. Lockhart, *	17	14	2	May 17.		
Allen & Son, *	28	8	4	May 17.		
Wesley Johnson, *	10	18	...	May 17.		
E. C. Read, *	15	15	...	May 17.		
Tracy Manufacturing Company, . .	80	307	47	May 18.		
Atlantic Refining Company, . . .	140	...	8	May 25.		
John Boggs,	24	43	...	May 27.		
Thos. Boggs,	65	60	...	May 27.	Clean and disinfect water closets.	Complied.
Wm. Keegan,	20	40	...	May 27.	Comply with section 2 and provide wash rooms for females.	Complied.
James Sullivan & Sons,	21	180	5	May 30.		
David Greer,	15	35	4	May 31.		
Stewart Bros.	6	50	3	May 31.		
Arlington Mills,	9	26	2	June 1.		
Jacob Miller & Sons,	16	44	2	June 1.		
Borel-Fox Company,	3	11	3	June 1.	Comply with sections 2, 3 and 10,	Complied. (Mill destroyed by fire.)
Oxford Hosiery Mills,	48	102	8	June 25.	Comply with sections 2 and 7, and designate water closets.	Complied.

* Thos. Taylor owner of these mills.

PHILADELPHIA, PA.—Continued.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.			Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12. 12 to 16.				
Bucks Hosiery Company,	Hosiery,	35	60	..	7 Fair,	June 25,	Comply with section 10,	Complied.
Baehman & Co.,	Woolens,	115	60	..	5 Good,	June 25,	Comply with section 2, cross-bars for all floor openings and designate water closets.	Complied.
Prince Worsted and Woolen Co.,	Worsted and woolens,	44	16	..	5 Good,	June 28,	Provide wash rooms for females.	Complied.
Reading Screw Company,	Screws,	38	18	..	22 do.	June 28,	Provide wash rooms for females.	Complied.
Montgomery Mills,	Carpets,	89	41	..	do.	June 28,	Provide wash rooms for females.	Complied.
Orianna Mills,	do.	251	166	..	51 do.	June 30,	Provide wash rooms for females.	Complied.
Keefe & Coon,	do.	165	..	..	9 Fair,	July 22,	Comply with section 2; screen and cleanse water closets.	Complied.
Middlesex Knitting Company,	Hosiery,	6	21	..	10 Good,	July 22,	Comply with section 3,	Complied.
Stinson Bros.,	Carpets,	315	175	..	28 do.	July 22,		
Horner Manufacturing Company,	Carpets and lace curtains,	375	275	..	124 do.	July 22,		
Washington Mills,	Merino, zephyr and woolen yarns,	60	10	..	6 do.	Aug. 4,	Comply with section 2 and 7 and designate water closets.	Complied.
Jas. Bryson, *	Cotton fabrics,	4	33	..	do.	Aug. 12,	{ Substitute iron for all wood platforms and steps to be found on external fire escape.	
John C. Watt, *	do.	26	44	..	3 do.	Aug. 12,		
John Williams,	Woolens,	55	70	..	20 Fair,	Aug. 12,		
Wesley Johnson,	Carpet,	14	14	..	Bad,	Aug. 13,	Provide sufficient number of water closets,	Complied.
Wood & Ward,	Turkish toweling,	30	70	..	Fair,	Aug. 13,	Regularly flush water closets,	Complied.
William Lockhart,	Carpet,	17	14	..	1 Good,	Aug. 13,	Keep hallway, stairs and sinks clean,	Complied.

* L. Belrose, owner.

	15	15	Fair.	Aug. 13,		Completed.
E. C. Read,	15	15	.. . . .	Aug. 13,	Water closets separate and apart and keep the same clean.	Completed.
Charles P. Cochrane,	33	10	1 do.	Aug. 13,	Water closets, hallways and stairs to be kept in clean condition.	Completed.
McLaughlin Bros.,	20	6	4 do.	Aug. 17,	Comply with section 7,	Completed.
Oldack Company,	25	25	2 Good,	Aug. 17,	Comply with section 2, clear away the obstruction on second floor.	Completed.
R. Granlees & Son,	40	65	1 do.	Aug. 19,	Provide certificates for children in your employ; also washing accommodations on each floor.	Completed.
Branch Southwark Mills Co.,	107	16	5 do.	Aug. 19,	Comply with sections 2, 3 and 7,	Completed.
Pennsylvania Woolen Mills,	162	249	22 Fair.	Aug. 23,	Comply with sections 2 and 3, water closets to be kept clean; also means of egress from third floor.	Completed.
Whitely Company,	33	15	10 Good,	Aug. 24,		Completed.
Avil Printing & Publishing House,	125	25	2 do.	Aug. 24,	Comply with sections 2 and 3,	Completed.
Historical Publishing Company,	69	81	9 do.	Aug. 24,	Comply with sections 2 and 3,	Completed.
Jenner's Laundry,	4	16	4 do.	Aug. 25,		Completed.
National Publishing Company,	159	122	2 do.	Aug. 25,	Comply with section 2, remove all obstructions in or about windows leading to fire escape.	Completed.
Crof & Allen,	200	250	56 do.	Aug. 27,	Comply with section 2, Increase water closet accommodations for female employees.	Completed.
Allen, Lane & Scott,	135	15	24 do.	April 12,		
H. Whitley & Sons,	33	17	17 do.	April 13,		
George Brooks & Son,	135	100	19 do.	April 14,		
John T. Bailey,	170	350	38 do.	Nov. 11,		
Wesley Johnson,	14	14	do.	Nov. 12,		
Devon Carpet Company,	33	10	1 do.	Nov. 12,		
William Lockhart,	16	15	1 do.	Nov. 12,		
Wood & Ward,	30	70	do.	Nov. 12,		
E. C. Read,	15	15	do.	Nov. 12,		
Carpet,						
do.						
Job printing,						
Book binding,						
Cotton goods,						
Woolen and worsted,						
Woolens,						
Mixed yarns,						
Printing and publishing,						
Publishing books and pamphlets,						
Laundry,						
Printing and publishing,						
Confectionery,						
Job printing,						
Yarns,						
Chemical and upholstery cloth,						
Cordage,						
Carpets,						
do.						
do.						
Turkish toweling,						
Carpets,						

PHILADELPHIA, PA—Continued.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.				Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12.	12 to 16.				
National Publishing Company, . .	Printing and publishing, . .	125	175	. .	8	Good,	Nov. 15.		
John Williams,	Woolen goods,	55	70	. .	20	do.	Nov. 17.		
Pennsylvania Woolen Mill, . . .	do,	162	249	. .	22	do.	Nov. 17.		
Emsley Manufacturing Company,	Woolen yarns,	54	15	. .	23	do.	Nov. 17.		
Southwark Mills Company,	Woolen goods,	75	475	. .	10	do.	Nov. 23.		
James Pollock & Son,	Carpets,	40	10	. .	. .	do.	Nov. 25.		
John C. Watt,	Cotton fabrics,	26	44	. .	3	do.	Nov. 25.		
James Bryson.	do.	10	40	do.	Nov. 25.		

TYRONE, PA.

Morrison & Cars Paper Company.	Paper,	165	35	. .	1	Good,	Nov. 3.		
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ALTOONA, PA.

Baltzell & Bro.,	Dry goods,	40	100	. .	9	Good,	Nov. 1.		
Wm. Gable & Co.,	do.	18	27	. .	5	do.	Nov. 1.		
Frank M. Morrow,	do.	10	15	. .	4	do.	Nov. 2.		
Schwarzenbach, Huber & Co., . .	Silk yarn,	47	79	. .	40	do.	Nov. 2.		

ROARING SPRINGS, PA.

Bare Paper Company.	Paper,	100	25	Good,	Nov. 1.	
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HOLLIDAYSBURG, PA.

Libby Hosiery Company.	Hosiery,	50	9	Good,	Nov. 2.	
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MANAYUNK, PHILADELPHIA, PA.

Clegg Manufacturing Company. .	Woolen goods.	24	21	. .	4	Good,	Dec. 31,	Provide proper covering to cogs on all carding machines and designate water closets.	Completed.
Dobson Manufacturing Company,	Silk, plush and carpets. . . .	800	1,400	. .	140	Bad.	Jan. 22,	Comply with sections 2, 7, 10 and 12 and erect fire escape.	
Dobson's Blanket Mill.	Blankets,	400	250	. .	80	do.	Jan. 27,	Comply with sections 2, 3, 7, 8, 9, 10 and 11 and erect fire escape.	

CLIFTON HEIGHTS, DELAWARE COUNTY, PA.

Levis Manufacturing Company, .	Woolen goods,	116	55	. .	25	Fair.	May 18,	Comply with sections 2, 3, 10 and 12 in every detail relating to fire escape.	Completed.
Caledonia Mills,	Cotton and woolen goods, . .	130	70	. .	20	Good,	May 18,	Comply with sections 2, 10 and 11,	Completed.

ASTON MILLS, DELAWARE COUNTY, PA.

Rhodes Bros.,	Cotton and woolen fabrics, . .	286	100	. .	46	Fair,	May 26,	Comply with sections 2, 3, 7, 8, 9 and 10. . .	Completed.
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GLEN RIDDLE, DELAWARE COUNTY, PA.

Glen Riddle Mills,	Cotton and woolen goods, . .	247	123	. .	45	Bad.	May 24,	Comply with sections 2, 3, 7, 8, 10 and 12.	
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LINWOOD, DELAWARE COUNTY, PA.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.				Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12.	12 to 16.				
Riverview Knitting Mills,	Hosiery, *	34	46	. .	4	Bad,	May 25,	Comply with section 2 and disinfect water closets.	Complied.

LENNI, DELAWARE COUNTY, PA.

Brookside Manufacturing Co . .	Cotton and woolen goods, . .	65	25	. .	9	Good,	May 25,	Comply with sections 2 and 3 and provide wash rooms for females.	
Mechlenberg Mills,	Woolen and cotton yarns, . .	12	13	. .	4	do.	June 2.		
Brookside Manufacturing Co. . .	Woolen fabrics,	64	36	. .	2	Fair,	June 3.		

DARBY, DELAWARE COUNTY, PA.

Imperial Mills,	Textile fabrics,	59	72	. .	20	Fair,	April 7,	Comply with sections 2 and 10,	Complied.
Keystone Paper Mills,	Paper,	20	30	Good,	April 8,		

EDDYSTONE, DELAWARE COUNTY, PA.

Eddystone Print Works,	Dyeing and printing cloths. .	652	87	. .	162	Good,	April 22,	Comply with section 3 and designate water closets.	Complied.
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UPLAND, DELAWARE COUNTY, PA.

J. P. Crozer & Sons,	Cotton goods,	100	175	. .	59	Fair,	April 26,	Comply with sections 7, 8 and 10,	Complied.
MEDIA, PA.									
Rose Valley Mills,	Woolens,	85	40	. .	10	Good,	May 19,		

TRAINER, PA.

Trainer Manufacturing Company, Factory 1 and 2.	Cotton yarns and ticking, . .	110	150	. .	56	Fair,	May 12,	Comply with sections 2, 7, 8 and 10, and provide external means of exit from top floor, east end of factory, and place railing about platform in factory No. 2.	Complied.
D. Trainer & Son's Manufacturing Company, Mill No. 3.	Cotton yarns,	24	56	. .	11	Good,	May 12,	Keep record book, box main driving belts to a depth of five feet, better light in girls' water closets, and a safety wiring should be placed on all uncovered cogs.	Complied.

CHESTER, DELAWARE COUNTY, PA.

Arasapha Manufacturing Co., . .	Cotton goods,	280	. . . .	. .	27	Good,	April 20,	Comply with section 7 and provide wash rooms for females.	Complied with except section 10.
J. Wm. Lewis & Co.,	do.	90	150	. .	18	do.	April 20,	Comply with sections 2, 3, 7, 8 and 10. . .	Complied.
Lilley & Son's Manufacturing Co.,	Cotton yarns, cotton and woolen goods.	51	86	. .	21	Fair,	April 26,	Comply with sections 2, 3, 8 and 10. . .	Complied.
Irving Lelper Manufacturing Co.,	Cotton yarns,	70	60	. .	24	Good.	April 27,	Comply with sections 2, 3 and 7, and provide wash rooms for females.	Complied.
Lilley Manufacturing Co.,	Cotton and woolen goods, . .	51	86	. .	21	do.	Nov. 8,		
Lilley Manufacturing Co.,	do. do. . . .	51	86	. .	21	do.	Nov. 19,		
Irving Lelper Manufacturing Co.,	Cotton yarns,	70	60	. .	24	do.	Nov. 19,		
Arasapha Manufacturing Co., . .	Cotton fabrics,	80	200	. .	27	do.	Nov. 19,		

NORRISTOWN, MONTGOMERY COUNTY, PA.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.				Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12.	12 to 16.				
Woodstock Woolen Mills,	Woolen goods,	125	110	..	16	Fair,	June 14,	Comply with sections 2, 3, 7 and 10, and re-construct fire escapes.	
Wyoming Mills,	Cotton yarns,	67	60	..	8	Good,	June 14,	Comply with sections 2 and 3, and provide wash rooms for females.	Complied.
Agenorla Mills,	Cotton and woolen goods,	72	40	..	10	do.	June 15,	Provide wash rooms for females, erect fire escape, and comply with section 11.	
Norristown Woolen Company,	Woolen goods,	65	35	..	2	do.	June 16,	Comply with sections 2 and 3, and provide wash rooms for females.	Complied.
Emery Shirt Factory,	Men's shirts,	4	81	..	2	Fair,	June 16,	Comply with sections 2 and 10 in every detail.	
Globe Knitting Company,	Hosiery,	15	150	..	47	do.	June 16,	Comply with sections 2, 3 and 10, and erect fire escape.	
Norristown Hosiery Company,	do.	8	67	..	3	do.	June 17,	Comply with sections 2 and 10,	Complied.
Norway Tack Company,	Tacks,	37	8	..	16	do.	July 1,	Comply with sections 2, 3, 7 and 11.	
Watt Company,	Woolens,	75	75	..	6	do.	July 1,	Provide proper wash rooms for females; erect fire escape.	Complied.
Quaker City Shirt Company,	Shirts,	10	130	..	..	do.	July 1,	Automatic closings to elevator, and erect fire escape.	
Keystone Hosiery Company,	Hosiery,	30	144	..	32	do.	July 13,	Comply with section 2,	Complied.
Hathway Shirt Company,	Shirts,	3	107	..	4	do.	July 13,	Post time slips and erect fire escape,	Complied.
Gresh Cigar Company,	Cigars,	30	50	..	20	do.	July 14,	Provide certificates for children in your employ.	Complied.
Hathway Shirt Factory,	Shirts,	3	107	..	4	do.	Nov. 11.		
Rambo & Regar,	Hosiery,	15	150	..	57	do.	Nov. 15.		

BRIDGEPORT, MONTGOMERY COUNTY, PA.

James Lees & Son's,	Woolen and worsted yarns, blankets and cassimeres.	371	520	..	235	Fair,	June 22,	Elevator closings; wash rooms for females; cleanse water closets; and comply with section 11.	Complied.
Rebecca Paper Mills,	Paper,	36	10	..	..	Good.	June 23,	Safety closings to elevators and properly guard belts and pulleys.	Complied.
Warrall and Taylor Woolen Co., .	Woolen goods.	52	78	..	5	Fair,	June 24,	Comply with section 3, and provide proper wash rooms and water closets for females.	Complied.
Barber Woolen Mills,	Woolen yarns,	16	6	..	7	do.	June 29,	Comply with sections 2 and 3; provide wash rooms for females.	Complied.
Ide and Haverstick Company, . .	Paper bags,	35	10	..	..	do.	June 29,	Comply with sections 3, 7, 10 and 11.	
Smith Manufacturing Company, .	Cotton and woolen goods, . .	33	46	..	15	do.	June 29,	Provide washing accommodations and designate water closets.	

CONSHOHOCKEN, MONTGOMERY COUNTY, PA.

Conshohocken Surgical Supply Company.	Surgical supplies,	34	38	..	17	Good,	July 29,		
J. & L. Lees,	Cottonades,	48	77	..	18	do.	Aug. 3.		
Merlon Worsted Mills,	Worsted yarns,	65	85	..	16	do.	Aug. 3,	Comply with section 2.	Complied.
Aramink Carpet Factory,	Carpet,	21	9	..	5	Fair,	Aug. 3,	Comply with sections 2, 3, 10 and 11, . .	Complied.
Conshohocken Woolen Co.,	Woolens,	169	107	..	32	do.	Aug. 5,	Comply with section 10 in every detail, . .	Complied.
Schuykill Woolen Mills,	Woolens,	68	25	..	10	Good,	Aug. 26,	Comply with section 2; provide closings for all door openings other than those leading to stairways; erect means of egress from third floor.	

LAFAYETTE, MONTGOMERY COUNTY, PA.

Riverside Paper Mills,	Paper,	165	49	Good.	July 28.		
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GULF MILLS, MONTGOMERY COUNTY, PA.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.				Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12.	12 to 16.				
Gulf Woolen Mills,	Woolen goods,	68	57	.	13	Fair.	Aug. 5,	Provide washing accommodations and designate water closets.	Complied.

SWEDELAND, MONTGOMERY COUNTY, PA.

Sweedeland Ticking Co.	Ticking,	23	17	.	5	Fair.	Aug. 17,	Comply with sections 2, 3, 11; extend or raise railing around main drive; provide wash rooms and water closets; erect fire escapes.	Complied.
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ACCIDENT REPORTS OF GEORGE J. MCCRANE—FIRST DISTRICT.

Date of accident.	PERSONS INJURED.	Age.	Establishment in which accident occurred.	Location.	Machine, etc., on which accident occurred.	Particulars and extent of injury.
1892.						
Dec. 16,	William Mertz, . . .	47	H. H. Sheip & Co.,	Philadelphia,	Resaw,	Carelessness on part of injured; part hand squeezed.
Dec. 21,	Agnes Maloy, . . .	16	Craven & Dearnley,	do.	Worsted spinning frame, . . .	While cleaning machine, thumb was caught and bruised.
Dec. 29,	Frank Shuster, . . .	16	James Stafford,	Manayunk,	Carding machine,	Caught between two gear wheels; one finger of left hand crushed.
Jan. 18,	George Hennessy, . .	44	Charles Spencer & Co.,	Philadelphia, . . . . .	. . . . .	Slipped and put his arm in dye kettle; scalded arm.
Jan. 25,	Ella Leyden,	21	Craven & Dearnley,	do.	Front rolls of gill box,	Attempted to take a lap from the apron of gill box; three fingers of right hand bruised.
Feb. 13,	S. A. Evans,	16	Stead & Miller,	do.	Elevator,	Caught between elevator and top of door; resulted in death.
Mar. 22,	Isaac Wright, . . .	50	M. & Wm. H. Nixon,	do. . . . .	. . . . .	Barrel of oil which he was handling rolled against him, breaking his leg.
Mar. 25,	Joseph Scully, . . .	19	Mason Fruit Jar Company,	Bridgesburg,	Stamping press,	Caught in cog wheel; flesh torn; not serious.
Mar. 31,	James Cole,	58	H. H. Shelp & Co.,	Philadelphia,	Rip saw,	While pushing board across table, board tilted and pushed hand into saw; loss of one finger.
April 9,	Laura Marquard, . .	18	Craven & Dearnley,	do.	Worsted spinning frame, . . .	While cleaning gearing, finger was caught; finger mashed.
April 23,	William Curry, . . .	23	William Holt & Son,	Manayunk,	Scouring machine,	Arm drawn into scouring machine; broken wrist.
April 25,	George T. Smith, . .	15	J. F. Lewis & Co.,	Chester,	Spreader machine,	Hand caught in machine in some unknown manner; laceration of hand.
May 2,	Charles Hollinger, . .	. . . .	Robertson & Hall,	Philadelphia,	Sewing machine,	Thumb pulled out by trying to remove belt.

ACCIDENTS—Continued.

Date of accident.	PERSON INJURED.	Age.	Establishment in which accident occurred.	Location.	Machine, etc., on which accident occurred.	Particulars and extent of injury.
June 2,	Ezekiel Pierce, . . .	36	Chester Manufacturing Co., . .	Chester,	Carding machine,	Caught in stripper of machine; flesh wound on hand.
June 3,	George Burgess, . .	18	A. J. Roach & Co.,	Philadelphia,	Dyeing-out machine,	Carelessness; part of nail taken off second finger of right hand.
June 17,	Michael Shultz, . . .		Canton Mills Company,	Manayunk,	Exhaust ventilator fan,	Two fingers of left hand taken off by putting his hand within reach of exhaust fan.
Aug. 10,	Martin Lamou, . . .	50	M. & Wm. H. Nixon Co.,	do. . . . .	. . . . .	Had his fingers caught between body and shafts of cart; fingers crushed.
Aug. 12,	Lawrence Cooling, . .	17	L. C. Krisher,	Philadelphia,	Carpet rolling machine,	Arm caught between rollers of machine; arm broken.
Aug. 17,	Ella Albright, . . .	16	Craven & Dearnley,	do.	Woolen twisting frame,	While taking waste off a bobbin her arm was caught between the gears and the guard; slight skin and flesh wound.
Sept. 10,	Wm. Weldon, . . .	18	Alex. Balfour & Sons,	do.	Gearing,	Caught in wheel; first joint of index finger of left hand cut off.
Sept. 30,	Jennie Cain,	14	Craven & Dearnley,	do.	Worsted spinning frame,	While attempting to take a lap from one of the rolls her finger was drawn in with the waste; part of finger torn off.
Sept. 30,	Wm. E. Fisher, . .	15	John Bromley & Sons,	do.	Pulley shafting,	Caught in shafting; lost parts of two fingers.
Oct. 27,	Thos. Kearney, . .	14	do.	do.	Gearing on loom,	Part of fingers taken off by putting it in cog wheel.
Oct. 30,	Henry Sirey,	14	John Herget,	do.	Foot press,	Not paying proper attention to his work; laceration of finger.
Nov. 23,	Unknown,	Unk.	A. Balfour & Sons,	do.	On shafting,	Clothing was caught in shafting while fixing electric wires from scaffold; leg and arm broken.
Nov. 23,	Andrew Albany, . .	53	M. & Wm. H. Nixon & Co.,	Manayunk,	Paper roll winding machine,	Clothing caught in set screw on shaft; head and arm cut.

REPORTS OF GEO. J. MCCRANE—1st DISTRICT—FOR THE YEAR 1892.

GERMANTOWN, PHILADELPHIA, PA.

No. 10.]

FACTORY INSPECTOR.

F. 87

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.				Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12.	12 to 16.				
Jefferson Mills,	Cotton, woollen and merino yarns.	20	4	.	6	Good.	Nov. 30.		
Charter Hosiery M'fg Co.,	Hosiery,	22	43	.	3	do.	Nov. 30.	Comply with sections 2 and 3,	Complied.
Chas. Chipman & Son,	Hosiery and underwear,	50	100	.	35	do.	Nov. 30.	Comply with sections 2 and 3,	Complied.
Woodrick & Bros.,	Hosiery and knit goods,	40	40	.	15	do.	Nov. 30.		
West & Hawthorn,	Hosiery,	30	70	.	24	do.	Dec. 1.		
Samuel West,	Fancy hosiery,	40	80	.	1	do.	Dec. 1.		
John S. Palmer,	Paper boxes,	8	12	.	3	Bad.	Dec. 2.	Comply with sections 2, 3, 10, 12,	Complied.
Lelcester Mills,	Knit goods and worsted cloth,	178	354	.	56	do.	Dec. 3.	Comply with sections 2, 3, 8, 10, 12,	Complied.
Wilson H. Brown & Co.,	Wool and merino yarns,	60	10	.	11	Good.	Dec. 3.		
J. & B. Allen,	Jerseys and knit goods,	100	200	.	3	do.	Dec. 4.		
George Peabody,	Knit jackets and hosiery,	60	140	.	64	do.	Dec. 4.		
Bradford Mills,	Worsted cloth,	33	67	.	24	do.	Jan. 22.	Comply with sections 2, 3, 18,	Complied.
John Axford,	Hosiery,	2	25	.	.	do.	Jan. 22.	Comply with sections 3, 18,	Complied.
Harrison & Malatrat,	Hosiery,	13	23	.	.	do.	Jan. 22.	Comply with sections 3, 8, 18,	Complied.
George S. Lees & Co.,	Carpet yarns,	14	7	.	3	do.	Jan. 22.	Comply with sections 2, 3, 18,	Complied.
Cromingham & Patton,	Knit goods,	14	66	.	4	do.	Feb. 1.		
Edward Mon & Son,	Hosiery,	7	37	.	1	do.	Feb. 1.		
Chas. Chipman & Son,	Hosiery and underwear,	75	150	.	26	do.	Feb. 8.		

GERMANTOWN, PHILADELPHIA Co., PA.—Continued.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.			Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12.	12 to 15.			
John Greaves & Bro.,	Cotton and woolen yarns, . .	23	6	..	6	Feb. 9.		
Bradbury Bros.,	Table covers,	50	100	..	8	Feb. 9.		
John S. Palmer & Son,	Hosiery,	10	15	..	..	Feb. 29.	Comply with section 11,	Permit granted.
Wakefield Knitting Co.,	Hosiery, gloves and mittens, .	10	13	..	3	Feb. 29.		
Wm. W. Fling & Bros.,	Hosiery,	6	15	..	3	Feb. 29.		
Standard Knitting Mills,	Jackets, gloves and hosiery, .	50	25	..	..	Mar. 2.		
Isaac Dalzell,	Hosiery,	20	25	..	2	Mar. 2.		
Charter Hosiery Co.,	Hosiery,	24	40	..	7	Mar. 2.	Comply with sections 2 and 3,	Complied.
Industry Knitting Mills,	Hosiery and Knit Goods, . .	25	55	..	10	Mar. 2.	Place railing around landing of steps, also hand rails on steps.	Complied.
Leicester Mills,	Knit goods & woolen suitings, .	364	163	..	48	Mar. 23.	Comply with sections 1, 8, 10 and 12,	Complied.
John S. Palmer,	Paper boxes,	10	10	..	5	Mar. 23.		
Bradford Mills,	Worsted and woolen goods, .	84	166	..	62	May 10.	Comply with section 7,	Complied.
Atlantic Knitting Mills,	Knit goods,	10	120	..	9	May 25.	Comply with sections 2 and 3 and guard elevator way on second floor.	Complied.
Jos. Schatcherd's Sons,	Woolen and merino yarns, .	138	2	..	13	May 25.		
Harrison & Mallatrell,	Hosiery,	17	25	..	2	May 25.		
J. Randall & Bros.,	Woolen yarns,	29	4	..	8	July 8.		
Standard Hosiery Mill,	Hosiery,	42	83	..	8	July 8.	Insufficient number of water closets, place board walk from factory to closet.	
Jos. Fling & Sons,	Cotton and merino yarns, . .	43	17	..	17	July 8.	Comply with sections 1, 2 and 3 and place guard rail around fly wheel of engine.	Complied.

Samuel Wood,	Woolen, cotton and merino yarns.	21	6	5	Fair,	July 15,	Comply with sections 2 and 3,	Complied.
Geo. Perberdy,	Hosiery and knit jackets, . .	50	200	78	do.	July 15,	Comply with sections 2 and 3, place platform in front of females' closet and partition in front of same, and have doors repaired on males' closet.	Complied.
Rainbow Knitting Mill,	Knit goods,	5	23	1	do.	July 15,		
Thos. Greaves,	Cardigan jackets,	10	10	1	do.	July 18,		
Isaac Springthorpe,	Knit goods,	7	13	1	do.	July 19,		Complied.
Bellevue Worsted Mills,	Worsted and woolen goods, . .	100	100	11	Good.	July 19,	Comply with sections 2 and 3,	
Thos. Greaves,	Hosiery,	10	14	3	Fair,	July 19,	Comply with sections 2 and 3,	Complied.
B. Hamill & Co.,	Woolen and merino yarns, . .	54	6	5	Good,	July 21,		
Novelty Knitting Mills,	Underwear,	2	22	. . .	do.	July 21,		
Wilson H. Brown & Co.,	Woolen and merino yarns, . .	60	15	17	Fair,	July 21,	Place water closet accommodations in factory.	Complied.
Wayne Mill,	Woolen and worsted goods, . .	50	25	5	Good,	Sept. 19,		
John Carbutt,	Dry plate and film,	9	12	. . .	do.	Sept. 19,		
Harrison & Mallatral,	Hosiery,	15	31	3	Fair,	Sept. 21,		
Germantown Spinning Company,	Cotton mull yarns,	42	23	28	Good,	Sept. 21,		
Eagle Knitting Mill,	Knitting mills,	20	55	10	do.	Sept. 21,		
Chas. Chipman & Son,	Hosiery,	118	232	21	do.	Sept. 28,		
Thos. W. Greaves,	"	10	20	3	Fair,	Sept. 28,		
Thos. W. Greaves,	Cardigan jackets,	13	13	. . .	do.	Mar. 10,		
John Ballantyne,	Hosiery,	15	48	7	do.	Mar. 10,		
Standard Knitting Mills,	"	31	31	. . .	do.	Mar. 10,		
Geo. Perberdy,	Knit jackets and hosiery, . .	141	59	66	do.	Mar. 11,		

MANAYUNK, PHILADELPHIA, PA.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.				Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Under 12.			12 to 16.				
		Males.	Females.						
Stafford & Co.,	Carpets and backing yarn, . .	42	12	..	4	Good,	Dec. 8,	Comply with sections 2 and 3,	Complied.
James Stafford,	Blankets and woolen goods, .	60	30	..	..	do.	Dec. 8.		
Shaw & Bowen,	Woolen spun yarns,	31	..	..	13	do.	Dec. 8.		
W. C. London & Co.,	Fine upholstery goods, . . .	10	20	..	3	do.	Dec. 8.		
Crompton Mills,	Plush goods, etc.,	43	47	..	1	do.	Dec. 8.		
D. & C. Ellis & Co.,	Cotton and woolen goods, . .	30	70	..	1	do.	Dec. 10.		
Simpson & Moore,	do.	8	16	..	1	do.	Dec. 10.	Comply with sections 2, 3 and 18,	Complied.
Randolph & Jenks,	All kinds of yarns,	38	15	..	4	Fair.	Dec. 10.	Comply with sections 7, 10 and 12,	Complied.
Seville Schofield & Co.,	Blankets, cloths and cassi- meres.	750	350	..	250	Good.	Jan. 11.	Comply with sections 3, 8 and 12,	Complied.
Arkwright Mills,	Ginghams,	42	43	..	..	do.	Jan. 13.	Comply with sections 3, 8, 12 and 18,	Mill closed.
Flat Rock Mills,	Paper,	164	86	..	..	do.	Jan. 13.	Place railing around fly wheel of engine, also post time sheets.	Complied.
Pittsfield Mills,	Cotton and woolen goods, . .	33	67	..	4	do.	Jan. 25.	Comply with sections 2, 3, 8 and 18,	Complied.
William E. Montague,	Cotton yarn,	18	7	..	4	do.	Mar. 9.		
Belmont Woolen Mills,	Worsted and woolen shoddies,	29	16	..	7	Bad,	Mar. 9.	Comply with sections 2, 3 and 10,	Complied.
Progress Mills,	Yarn, plushes and blankets,	85	85	..	7	Good,	Mar. 9.	Comply with sections 2, 8 and 12,	Complied.
East Economy Mills,	Worsted yarns,	30	133	..	89	do.	Mar. 14.	New ropes in window leading to fire escape; repair landing on fire escape.	Complied.
Perseverance Mills,	Cotton yarn,	58	14	..	13	do.	Mar. 25.		
Collins, Alkman & Co.,	Plushes,	10	25	..	..	do.	Mar. 25.	Comply with sections 8 and 10,	Complied.

John Dobson, Rock Hill Mill	Woolen yarn,	33	2	11	do.	April 19.	Complied.
William Holt & Son,	Cotton and woolen dress goods.	148	80	19	Fair.	April 30.	Comply with sections 3, 7, 8 and 10,
Harmony Mills,	Woolen and cotton yarns, . . .	37	..	12	Good,	May 25.	Complied except the washing-accommodations.
Pekin Mills,	Cotton and woolen goods, . .	50	75	12	Fair,	May 25.	Automatic traps to elevator on each floor; place safe-guards over rubber gears on all cards and provide washing accommodations in each room as required by law.
E. Luckhardt,	Cotton and woolen yarns, . .	37	13	4	Bad,	July 7.	Place covering over rubber gears; gates or rails on doors leading to hoist; also water closet conveniences.
A. Platt & Bro.,	Woolen and merino yarns, . .	100	40	23	Fair.	July 7.	Insufficient number of water closets; place sinks in female room for washing purposes; repair bridge on second floor; place rails on side of bridge on fourth floor.
Carter & Lord,	Blankets, backing and yarns,	74	17	2	Bad,	July 7.	Comply with sections 2 and 3; box in belt and pulley on second floor; separate water closets for females.
James Stafford,	Blankets,	52	64	..	Good,	July 13.	Complied.
Robert Wilde's Sons,	Carpet yarns,	34	16	..	Fair,	July 13.	Complied.
Stafford & Co.,	Carpet and backing yarn, . .	43	17	5	do.	July 13.	Erect fire escape.
Roxborough Mills,	Cotton and woolen goods, . .	34	65	7	Bad,	July 20.	Properly underdrain water closets and guard cellar window.
A. Flanagan & Bro.,	Carpet yarns,	48	12	1	Fair,	July 20.	Erect fire escape, provide place for oil barrel.
T. Kenworthy & Bro.,	Worsted and woolen yarns, .	39	75	43	do.	July 20.	Provide sinks for washing purposes,
Simpson & Moore,	Cotton and woolen goods, . .	15	24	..	do.	July 27.	
Wabash Mills,	Yarns,	40	20	3	do.	July 27.	
Arkwright Mills,	Coat linings and chevriots, . .	35	29	..	do.	July 27.	
Collins & Alkman Co.,	Plushes,	22	18	..	do.	Aug. 19.	
James Brown, Jr.,	Paper cop tubes,	4	11	8	Good.	Aug. 19.	Comply in full with sections 2 and 3; box belt on second and third floors; place permanent steps at window leading to fire escape.
M. & Wm. H. Nixon,	Paper,	205	80	2	do.	Aug. 19.	
Progress Mills,	Blankets and plush,	90	90	6	Fair,	Sept. 22.	

MANAYUNK, PHILADELPHIA, PA.—Continued.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.			Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12. 12 to 16.				
Baker, Holt & Co.,	Pushes,	4	16	. . .	Fair,	Sept. 22,		
Elton Mills,	Dress goods,	32	70	. . . 2	do.	Sept. 22,	Automatic gates to elevator and provide wash rooms for females.	Complied.
A. Platt & Bros.,	Woolen, merino and cotton yarns.	100	50	. . .	do.	Nov. 14,		
Aeme Worsted Company,	Worsted goods,	20	10	. . . 1	do.	Nov. 14,	Provide water closet accommodations.	
Flat Rock Mills,	Paper,	204	86	. . . 1	Good,	Nov. 25,		
Roxborough Mills,	Cotton goods,	41	64	. . . 11	do.	Nov. 25,		
Pekin Mills,	Cotton and woolen goods,	47	78	. . . 9	Bad,	Nov. 25,		

BRISTOL, BUCKS COUNTY, PA.

Wilson and Fennimore Company,	Paper hangings,	117	3	. . . 17	Fair,	Jan. 28,	Comply with sections 2, 3 and 10,	Complied.
Lewis Jones,	Hosiery and underwear,	159	316	. . .	do.	Jan. 28,	Comply with sections 3 and 10, and place railing in front of fly wheel.	Complied.
Providence Hosiery Mill,	Hosiery,	25	150	. . . 28	do.	Jan. 28,	Guard fly wheel on engine, and comply with section 10.	Complied.
William H. Grundy & Co.,	Worsted yarns,	123	113	. . . 77	Good,	Jan. 29,		
Edward T. Steel & Co.,	Worsted coatings, etc.,	92	108	. . . 75	do.	Jan. 29,	Comply with sections 2 and 3, guard fly wheel on engine and erect fire escape.	Complied.

FRANKFORD, PHILADELPHIA.

Wingohocking Mills,	Cotton yarns,	50	100	45	Good,	Dec. 17,	Comply with section 2, and have door placed on water closet.	Complied.
Aramingo Mills Company,	Table covers and gingham,	20	60	4	do.	Dec. 18.		
Robert Dallas,	Cotton and woolen goods,	5	28	3	do.	Feb. 2.	Comply with sections 1 and 11.	Complied.
Eastlake Manufacturing Co.,	Furniture glimps,	13	35	5	do.	Feb. 2.		
Samuel Campbell,	Cotton and woolen goods,	33	32	..	do.	Feb. 2.		
Caldwell, Antrim & Co.,	Umbrellas,	20	35	..	do.	Feb. 2.		
Fred W. Shumons,	Hostery,	5	45	..	do.	May 18.		
James Pollock,	Table covers,	19	41	2	Fair,	May 18.		
The Aramingo Mills Company,	Cotton goods,	42	48	4	Good,	May 18.		
C. H. Sprowles,	Paper boxes,	1	13	..	do.	May 20,	Place automatic closings to elevator on each floor.	Complied.
Warwick, Newberry & Co.,	Umbrella and parasol sticks,	90	20	8	do.	May 20.		
S. W. Evans,	Umbrella mountings and brass novelties,	169	56	87	Fair,	May 20.		
Miller Lock Company,	Keyler's locks,	3	12	..	Good,	May 20.		
Frankford Hostery Mill,	Hostery,	100	200	40	do.	July 5.	Comply with sections 3 and 11.	Complied.
Berkshire Manufacturing Company Mill No. 2.	Textile fabrics,	60	100	4	do.	July 5.		
Walker & Richman,	Hostery and weaving yarns,	40	55	6	Fair,	July 5.	Comply with sections 2 and 3, place new pipe in females' water closet, also erect new water closet for females on first floor.	Complied.
Clark & O'Neill,	Damask,	56	54	1	Good,	July 5.	Place permanent stairs from window on third floor of main building to adjoining roof.	Complied.
Malcolm Mills Company,	Fancy yarns, polished thread,	10	32	3	Good,	July 6.		
Robert Megowan,	Cotton and woolen goods,	10	22	..	Fair,	July 6.		
John Sidebotham,	Webbings and bludings,	3	11	4	Good,	July 11.		
Wingohocking Mills,	Cotton yarns,	58	117	51	do.	July 11.	Comply with section 1, also guard gears on water pump in main building.	Complied.
Largdell Mills,	Textile fabrics,	67	133	4	do.	July 11.	Automatic closings at each elevator, box belt in winding room.	Complied.

FRANKFORD, PHILADELPHIA, PA.—Continued.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.				Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12.	12 to 16.				
Eastlake Manufacturing Co., . .	Furniture gumps,	35	78	1	17	Good,	Sept. 1,	Comply with sections 2, 3, and have belt boxed on second floor.	Complied.
Caldwell, Antrim & Co.,	Umbrellas,	20	40	..	4	do.	Sept. 1.		
Warwick, Newberry & Co., . . .	Umbrellas and parasol sticks,	69	16	..	11	Fair,	Sept. 1.		
Frankford County Operative Co.,	Turkey red damask,	29	9	..	1	Good,	Sept. 20.		
Emerald Mills,	Worsted goods,	56	114	..	10	do.	Sept. 20.		
Pearson & Co.,	Dress goods and ginghams, . .	13	12	..	1	do.	Sept. 20.		
Miller Lock Company,	Locks,	68	17	..	1	do.	Nov. 15.		
Fred W. Shnons,	Hosiery,	8	32	..	8	Fair,	Nov. 15.		
Aramingo Mills Company,	Ginghams and table covers, . .	30	50	..	1	do.	Nov. 15.		

WAYNE JUNCTION, PA.

Cope & Co.,	Dress goods,	40	60	.	6	Good,	Dec. 1.		
John Carbutt,	Photographers plates,	11	10	.	.	do.	Dec. 2.		
New Glen Echo Mills,	Carpets,	150	250	.	65	do.	May 10.		
Wayne Mill,	Worsted goods,	50	25	.	2	do.	May 24.	Place guard around fly wheel of engine, .	Complied.
Cope & Co.,	Worsted and woolen goods, . .	50	50	.	4	do.	June 8.	The door in partition on third floor of main building leading to Chittick & Son's must be kept open so as not to obstruct main stairway.	Complied.

BRIDESBURG, PHILADELPHIA, PA.

Mason Fruit Jar Company,	331	49	50	Good.	Dec. 11.	Comply with sections 3, 8 and 10.	Complied.
Mason Fruit Jar Company,	296	49	120	Bad.	Mar. 31.		
I. Jones,	15	9	3	Fair.	July 12.	Provide additional water-closets, also washing accommodations for females.	Complied.
Robert Lewis,	39	11	1	Bad.	July 12.		
I. Jones,	16	12	6	Good.	Sept. 20.		

PHILADELPHIA, PA.

Thomas Clegg & Co.,	22	13	5	Good.	Dec. 2.	Comply with sections 2, 3, 8 and 12.	Complied.
Wm. D. Dounton,	11	9	5	do.	Dec. 2.		
Stenton Knitting Mills,	15	35	...	do.	Dec. 2.	Comply with sections 10 and 12,	Complied.
Wm. Coulter,	9	11	2	Bad.	Dec. 3.		
Whittle & Leavers,	7	43	8	Good.	Dec. 3.	Place railing round fly wheel of engine, . .	Complied.
James Kitchenman,	32	93	5	do.	Dec. 9.		
Barnes & Beyer,	134	296	40	do.	Dec. 9.	Comply with section 12,	Complied.
A. Boyle & Bro.,	7	65	30	do.	Dec. 9.		
Albion Mills,	150	150	13	do.	Dec. 10.	Comply with sections 2, 3 and 18,	Complied.
Delaware Glass Works,	55	...	20	do.	Dec. 11.		
Albert E. Schofield,	13	9	8	do.	Dec. 17.	Comply with sections 2, 3 and 18,	Complied.
Dover Mills,	11	34	...	do.	Dec. 17.		
John R. Bill & Bro.,	4	11	...	do.	Dec. 18.	Comply with sections 2, 3 and 18,	Complied.
Frankford Carpet Mills,	10	20	1	do	Dec. 18.		
Franklin Flint Glass Works,	385	15	48	do.	Dec. 22.	Place railing round fly wheel in engine room; also round elevator in chimney room.	Complied.

PHILADELPHIA, PA.—Continued.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.				Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12.	12 to 16.				
Kensington Knitting Mill,	Cardigan jackets and hosiery.	50	100	..	40	Good,	Dec. 22.		
James Pollock & Son,	Venetian carpets,	38	12	..	..	do.	Dec. 23.		
Henry Diekel & Son,	Ingrain carpets,	21	29	..	..	do.	Dec. 23.		
Jefferson Flint Glass Works, . . .	Globes and lamp chimneys, .	227	3	..	23	do.	Dec. 23.	Comply with sections 2, 3, 7 and 18,	Complied.
Cameron & Zimmerman,	Turkey red table covers, . . .	16	26	..	3	do.	Jan. 7.		
Philadelphia City Pottery,	Pottery,	139	21	..	2	do.	Jan. 8.	Comply with sections 2 and 3,	Complied.
John Sidebotham,	Wicks, webbings and tapes, .	2	11	..	4	do.	Jan. 8.	Comply with sections 2, 3 and 18,	Complied.
Geo. Brusch & Co.,	Fine confectionery,	15	45	..	6	Fair,	Jan. 9.	Comply with sections 2, 3, 10 and 18,	Complied.
Hardley, Fink & Co.,	Morocco,	45	..	..	11	Good,	Jan. 9.		
H. B. Hoffman,	Paper boxes,	10	50	..	5	do.	Jan. 9.	Place covering over stairs; also over landing to females' water closet.	Complied.
Geo. Baum & Son,	Glazed kid,	60	..	..	20	do.	Jan. 12.		
Wolf & Randolph,	Shoe black,	25	25	..	16	do.	Jan. 12.	Erect fire escape.	
S. D. Wright & Co.,	Worsted and cotton fabrics, .	3	32	..	5	do.	Jan. 12.	Comply with sections 2, 3 and 18,	Complied.
Henry Grant & Son,	Woolen and merino yarns, .	23	1	..	10	do.	Jan. 14.		
Hope Carpet Mills,	Ingrain carpets,	30	10	..	..	do.	Jan. 14.	Comply with sections 3, 8, 12 and 18,	Complied.
Phoenix Carpet Mill,	do.	7	13	..	..	do.	Jan. 14.		
Johnson & Robertson,	Plushes,	2	11	..	1	do.	Jan. 20.	Comply with sections 2, 3 and 18,	Complied.
Nathan Miller,	Ingrain carpets,	17	10	..	2	do.	Jan. 20.	Comply with sections 2, 3 and 18,	Complied.
Wm. Hunter, Jr., & Co.,	Silk and cotton gimps, . . .	2	36	..	5	Bad,	Jan. 20.	Comply with section 10,	Complied.

Robert Blood,	Hostery,	15	45	27	do.	Jan. 21.	Comply with sections 7, 10 and 18,	Completed.
-Universal Hostery Mills,	do.	33	67	28	Good,	Jan. 21.		
Nottingham Mills,	do.	16	34	4	do.	Jan. 21.		
John Bromley & Sons,	Smyrna rugs,	475	125	70	Fair,	Jan. 26.	Comply with sections 2, 3, 7, 10 and 12,	Completed.
Wm. Scholes & Son,	Woolen yarns,	64	25	20	do.	Jan. 26.	Comply with sections 2, 8 and 10,	Completed.
Fells & Co.,	Toilet soaps,	3	62	4	Good,	Jan. 27.	Comply with section 2,	Completed.
Graham & Reid,	Hostery,	4	36	5	do.	Jan. 27.		
National Mills,	Ingrain carpets,	7	10	...	do.	Jan. 27.		
Standard Mills,	Worsted goods,	7	10	1	do.	Feb. 1.		
B. Patterson & Co.,	Hammocks,	12	22	2	do.	Feb. 1.		
John F. Lodge,	Cotton carpet yarns,	51	19	3	Bad,	Feb. 2.	Comply with section 10,	Completed.
S. Vernon,	Hostery,	15	35	4	Good,	Feb. 2.	Gates to elevator,	Completed.
James Hogg,	Hostery and stockinet cloth,	3	72	1	do.	Feb. 4.		
C. & F. Boulter,	Hostery, caps and knit goods,	12	48	6	do.	Feb. 4.		
Alfred Oliver,	Stockinet cloth,	25	50	...	Good,	Feb. 4.		
Archibald Holmes,	Ingrain carpets,	19	12	...	do.	Feb. 4.	Comply with section 1,	Completed.
James Galbraith & Bros.,	Ingrain carpets,	56	29	2	Fair,	Feb. 4.	Comply with sections 1 and 10,	Completed.
Crescent Hostery Mills,	Hostery,	94	49	12	Good,	Feb. 5.		
E. Sutro,	do.	60	80	37	do.	Feb. 5.		
James Long Bro. & Co.,	Cotton and woolen goods,	85	85	15	do.	Feb. 9.		
Werner Tschner,	Silk ribbons and dress goods,	55	110	13	do.	Feb. 10.		
Franklin Carpet Mills,	Ingrain carpets,	20	90	3	Good	Mar. 1.		Completed.
Philadelphia Cordage Works,	Cordage and ropes,	354	149	72	Fair,	Mar. 4.	Gate to elevator, guard fly-wheel of engine, disinfect water closets and provide means of communication to engine rooms.	
Diamond Mills,	Upholstery goods,	15	40	7	Fair,	Mar. 5.	Comply with sections 2, 3, 7, 10 and 12,	Partly completed.
Allegheny Worsted Mills,	Fine worsted yarns,	52	38	22	Good,	Mar. 7.		
Union Mills,	Hostery and fancy knit goods,	25	175	22	do.	Mar. 7.		
Orianna Mills,	Carpet rugs and mats,	250	200	63	do.	Mar. 7.		
James H. Kerr,	Cotton and woolen goods,	59	30	3	Fair,	Mar. 8.	Comply with section 10,	Completed.

PHILADELPHIA, PA.—Continued.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.				Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12.	12 to 16.				
Hyndman & Moore,	Curtains and draperies, . . .	42	65	..	18	Good.	Mar. 8.		
M. Lafferty,	Woolen yarns,	23	11	..	12	do.	Mar. 8.		
Clifton Mills,	Worsted suitings,	64	35	..	6	do.	Mar. 11.	Comply with section 2,	Complied.
Enterprise Carpet Mills,	Tapestry and velvet Brussels,	20	15	..	5	do.	Mar. 11.	Comply with sections 2, 3 and 8,	Complied.
Camden Thread Company,	Thread,	10	25	..	..	do.	Mar. 11.	Erect fire escape.	
Nahm & Bros.,	Fine shoes,	42	18	..	4	do.	Mar. 11.	Comply with sections 2, 3, 11 and place railing around fly-wheel of engine.	Complied.
Bromley Manufacturing Co.,	Chenille curtains and Smyrna rugs,	176	624	..	178	Bad.	Mar. 15.	Comply with sections 2, 10 and 12,	Complied.
John Bromley & Son,	Draperies, rugs and lace curtains,	524	381	..	63	Fair.	Mar. 15.	Comply with sections 2, 3 and 10,	Complied.
Westphalia Mills,	Curtains,	48	40	..	12	Good.	Mar. 17.		
Utility Mills,	Chenille curtains,	26	14	..	7	do.	Mar. 17.	Comply with sections 2, 3 and 10,	Complied.
Black Diamond File Works,	Files,	275	75	..	65	do.	Mar. 17.	Comply with section 2 and cover fan in cutting room,	Complied.
Rock Carpet Mills,	Ingrain carpets,	32	50	..	1	do.	Mar. 21.	Comply with section 10,	Complied.
Cambria Carpet Mills,	do. do.,	145	75	..	3	do.	Mar. 21.	Comply with sections 10 and 12,	Complied.
Washington Flint Glass Works,	Flint and colored glassware,	264	11	..	23	do.	Mar. 22.		
Nepaul Mills,	Upholstery goods,	80	320	..	43	do.	Mar. 22.		
Dyottville Glass Works,	Bottles,	222	..	..	17	do.	Mar. 22.		
A. Schoenhut & Co.,	Toy pianos,	19	11	..	10	do.	Mar. 22.		
Lykes Bros.,	Carpet yarns,	25	12	..	..	do.	Mar. 24.	Comply with sections 10 and 12,	Complied.

	40	40	40	do.	Mar. 24,	Comply with sections 10 and 12.	Completed.
D. McDowell,				do.	Mar. 26.		
A. Schoenhut & Co.,	35	35	14	do.	Mar. 28.		
Atlas Mills,	143	40	51	do.	Mar. 28.		
W. C. Collins & Co.,	19	38	5	do.	Mar. 28.		
R. J. Stinson,	40	20	4	do.	Mar. 28.		
Collingwood Mills,	222	263	102	do.	Mar. 29.		
Mineret Mills,	27	23	4	do.	Mar. 29.		
Frankford Carpet Mills,	11	28	4	do.	Mar. 29.		
S. B. Ferguson & Co.,	8	72	18	do.	Mar. 30.		
Maple Hosiery Mills,	4	16	5	do.	Mar. 30.	Comply with sections 2, 3 and 11.	Completed.
Wilson & Co.,	17	33	6	do.	Mar. 30.		
H. C. Fox & Sons,		14	5	do.	April 1,	Comply with sections 2, 3, 7, 10 and 12.	Completed.
Alex. Balfour & Sons,	125	65	1	do.	April 4,	Comply with sections 2, 3, 8, 10, 11 and 12.	Completed.
E. Eddishaw,	7	9	3	do.	April 6,	Comply with sections 2, 3 and 11.	Completed.
Kront & Flite,	3	15	2	do.	April 6,	Comply with sections 2 and 3.	Completed.
Thomas Hulton,	44	4	10	do.	April 6,	Comply with sections 2 and 3 and erect fire escape.	Completed.
Wm. Coulter,	10	14	2	do.	April 6.		
Whittle & Leavers,	50		9	do.	April 6.		
E. H. Masland & Sons,	135	40	2	do.	April 6.		
Craven & Dearnley,	98	193	57	do.	April 15,	Designate water closets. repair door window and leak in same. Remove buttons from windows leading to fire escape.	Completed.
Emul, Wahl & Co.,	135	15	20	do.	April 21,	Comply with sections 2, 3 and 7.	Completed.
D. H. Stroud,	50	15	1	do.	May 2,	Comply with sections 1, 3 and 8. and place railing around main belt in engine room. Place partition in front of males' water closet and place hand rail on back stairway.	Completed.
National Button Works,	6	12	2	Bad,	May 2,	Comply with section 10.	Completed.
John Blood & Co.,	80	320	80	Good,	May 4.		
Robertson & Hall,	13	14	5	Fair.	May 6,	Comply with sections 2, 3, 10 and 11, and have water closets regularly flushed and disinfected.	Completed.

PHILADELPHIA, PA.—Continued.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.			Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12. 12 to 16.				
Brown, Hunt & Co.,	Hosiery,	8	32	..	6	May 6.		Compliance.
E. Magram,	Cotton and woolen goods, . .	2	16	..	..	May 6.	Comply with sections 2 and 3, and guard back of flywheel of engine.	Complied.
Ormlston M'f'g Co.,	Knit goods,	20	130	..	8	May 11.	Provide sufficient water supply on fourth floor.	Complied.
Malta Mill Co.,	Woolen and worsted goods, . .	50	10	..	..	May 11.	Comply with sections 2, 3 and 11,	Complied.
The Blair Hamilton Co.,	Chenille curtains,	55	30	..	3	May 11.	Comply with sections 2, 3 and 11,	Complied.
Chatham Mills,	Wool shoddies,	14	18	..	1	May 13.		
Excelsior Mills,	Upholstery goods,	64	80	..	37	May 17.		
Providence Dye and Finishing Works,	Dyeing and finishing,	340	60	..	12	May 17.	Comply with sections 7 and 8.	
W. A. Gardner,	Shawls,	2	13	..	3	May 19.		
Murray Flint Glass Works,	Globes and shades,	193	7	..	43	May 19.	Comply with section 8 and place stationary ladder from ground to top of glasshouse, to be used in case of fire.	Complied.
J. Barton Smith & Co.,	Tools and specialties,	139	1	..	13	May 20.		
Louis Weber & Co.,	Hosiery,	25	85	..	17	May 24.		
Falcon Hosiery Mills,	Hosiery,	24	46	..	12	May 27.		
Samuel R. Read,	Ladies' shoes,	20	11	..	2	May 27.		
The Welcome M'f'g Co., *	Tiekings and shirtings, . . .	7	9	..	1	May 27.	Comply with section 7, Provide washing accommodations in each room as required by section 10, and have well of water closet drained out immediately.	Complied.
Kirk & Barnes, *	Cotton and woolen goods, . .	13	19	..	1	May 27.		
Cumberland Mills, *	Cotton and woolen goods, . .	2	32	..	..	May 27.		

* John Maier, owner.

York Mill (Carson & Irwin), . . .	33	12	1	do.	May 27,	Clean well of water closets, also place partition in front of the one used by females.	Complied.
Ingrain earpets,							
James Kitchenman,	29	80	4	Good.	May 31.		
Henry Diekle & Son,	30	30	..	do.	May 31.		
Price & Vogt,	36	24	..	do.	May 31.		
S. D. Wright & Co.	4	56	7	do.	June 1.		
Silk, worsted and cotton fabrics.							
Philadelphia Paper Box Company,	8	37	6	do.	June 1.		
Wolf & Randolph,	15	20	6	do.	June 1.		
Geo. Breisch & Co.,	10	30	10	do.	June 1.		
Robert Blood,	15	45	16	do.	June 2.	Automatic traps to elevator,	Complied.
S. Vernon,	45	35	9	do.	June 2.	Automatic traps to elevator.	
A. J. Reach & Co.,	115	35	23	do.	June 2.		
James Doak, Jr., & Co.,	79	96	24	Bad,	June 3.		
Erhard Bisevanger,	23	13	..	Good,	June 6.		
Sherman Carpet Mill,	85	50	..	Good,	June 6.		
J. R. Bill & Bros.,	5	9	4	do.	June 6.		
P. J. Ritter,	40	10	1	do.	June 7.		
Globe Mills,	40	40	4	do.	June 7.		
Nahm Bros.,	42	18	6	do.	June 7.		
Grabam Reid,	4	40	5	do.	June 7.		
Wm. D. Dounton,	10	7	8	do.	June 8.		
Stenton Knitting Mills,	16	34	..	do.	June 8.		
Delaware Glass Works,	52	..	11	do.	June 9.		
James Bole,	18	11	..	do.	June 9.		
James Meadowcroft's Sons,	16	10	6	do.	June 9.		
E. Eddishaw,	5	10	3	do.	June 13.		
John Hanlifen & Co.,	30	120	9	Fair,	June 13.		
Phenix Carpet Mills,	15	10	..	Good,	June 13.		
Ingrain earpets,							

PHILADELPHIA, PA.—Continued.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.			Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12. 12 to 16.				
Thomas Jagers,	Cotton and woolen yarns, . .	38	14	..	Fair,	June 14.		
H. Whitaker Sons,	Carpet yarns,	31	12	..	Good,	June 14.		
Joseph T. Smith,	Worsted yarns,	15	45	..	do.	June 14.		
A. Boyle & Bro.	Hosiery,	15	75	..	Bad,	June 15.	Have water closets properly underdrained,	Complied.
Robert Dallas,	Cotton and woolen goods, . .	7	26	..	Good,	June 29.		
Pilling & Madeley,	Hosiery,	95	601	..	do.	June 30.		
Hæflich & Wilson,	Ingrain carpets,	25	25	..	Fair,	July 1.	Insufficient water supply in males' water closet.	Complied.
Laten C. Krisher,	do. do.	105	20	..	do.	July 1.	Comply with sections 2 and 3. and erect water closets.	Complied.
Thomas Halton,	Jacquard machines,	50	3	..	do.	July 14.		
Sykes Bros.,	Carpet yarns,	31	10	..	do.	July 14.		
James Long, Bro. & Co.,	Cotton and woolen goods, . .	103	103	..	do.	July 14.		
Perseverance Mill,	Silk, cotton and narrow fabrics.	3	17	..	do.	July 22.		
Nathan Miller,	Ingrain carpets,	18	12	..	do.	July 22.		
Utility Mills,	Cherille curtains,	26	25	..	do.	July 22.		
Cameron & Zimmerman,	Upholstery and table covers,	18	21	..	Good.	July 26.		
George S. Cox,	Turkish towels and novelties.	20	25	..	do.	July 26.		
Westphalia Mills,	Cherille curtains,	45	34	..	Fair,	July 28.	Place rat's across door on first floor; also wire screen on fan on same floor.	Complied.
John Blood & Bro.,	Hosiery and knit goods, . . .	50	150	..	do.	July 29.		

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PHILADELPHIA—Continued.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.				Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12.	12 to 16.				
McCaffrey & Co.,	Fles,	90	..	..	10	Bad,	Aug. 18,		
J. M. Schwehm,	Hair cloth & upholstery goods,	21	14	..	3	Good,	Aug. 18.		
Camden Thread Company,	Glazed yarns,	15	15	..	..	do.	Aug. 18.		
G. F. Bechman,	Silk, mohair & worsted plush,	3	10	..	3	do.	Aug. 18.		
D. McDowell,	Ingrain carpets,	38	25	..	..	Fair,	Aug. 23.		
Clegg & Bro.,	Wool and shoddies,	14	15	..	1	Good,	Aug. 23.		
Orniston Manufacturing Co., . .	Knit goods,	25	175	..	12	do.	Aug. 24.		
Emil Wahl,	Fancy buttons,	115	15	..	32	Fair,	Aug. 24.		
Philadelphia Manufacturing Co.,	Chenille curtains and table covers,	35	40	..	11	Bad,	Aug. 25,	Have water closets provided with better ventilation and light, and a sufficient supply of water, repair windows in same, and keep them at all times in a clean condition.	
Alnsworth & Sharp,	Cotton, woolen, worsted and silk goods.	12	22	..	2	Fair,	Aug. 25.		
Lemuth & Glenk,	Hair cloth,	4	16	..	..	do.	Aug. 25.		
Isaac Lockhart,	Ingrain carpet,	8	19	..	..	do.	Aug. 25.		
Greenhalgh & Wadsworth,	Silk, mohair and worsted plush.	11	24	..	..	Good,	Aug. 26.		
James Hogg,	Men's and ladies' coats and waists.	10	50	..	1	do.	Aug. 26.		
Craven & Dearnley,	Worsteds, woolen and mohair yarns.	103	200	..	101	do.	Aug. 26.		
C & F. Boulter,	Hosiery,	9	25	..	6	do.	Aug. 26.		

	40	10	do.	Aug. 29.
Malta Mills Company,			do.	Aug. 29.
The Blair Hamilton Company,	30	50	11	Aug. 29.
A. Boyle & Bro.,	12	78	40	Aug. 30.
Franklin Carpet Mills,	43	82	3	Aug. 31.
Standard Mills,	13	41	2	Sept. 2.
Wm. Seholes & Son,	72	18	24	Sept. 2.
Falcon Hosiery Mill,	17	48	2	Sept. 2.
Archibald Holmes,	26	10	..	Sept. 6.
The Orinoka Mills,	144	121	40	Sept. 6.
Somerset Carpet Mills,	45	30	2	Sept. 6.
Properly underdrain water closets; have exhaust pipe on engine room roof extended to the top of roof on main building; box mule head on fourth floor.				
Clifton Mills,	55	38	3	Sept. 8.
Stead & Miller,	134	266	60	Sept. 12.
Wm. Hunter, Jr. & Co.,	2	38	1	Sept. 12.
Johnson & Robertson,	1	11	2	Sept. 12.
Michael Lafferty,	21	13	7	Sept. 13.
Woodcock Bros.,	26	35	16	Sept. 14.
Charter Hosiery M'fg Co.,	24	40	8	Sept. 14.
Isaac Dalzell,	20	40	1	Sept. 14.
Warner & Welland,	20	20	4	Sept. 15.
Cambria Carpet Mills,	100	100	5	Sept. 15.
Boltz & Clymer Company,	274	100	1	Sept. 15.
James Meadowcroft & Son,	8	8	9	Sept. 16.
Lincoln Carpet Mills,	18	12	..	Sept. 16.
Brown, Hunt & Co.,	5	45	11	Sept. 16.
E. Noon & Son,	20	30	1	Sept. 19.
Dover Mills,	10	24	1	Sept. 23.
Albert E. Schofield,	15	9	8	Sept. 23.
Woolen and worsted goods,				
Chenille curtains,				
Hosiery,				
Ingrain carpets,				
Woolen and worsted goods,				
Woolen yarns,				
Hosiery,				
Ingrain carpets,				
Draperies and curtains,				
Ingrain carpets,				
Worsted coating and suitings,				
Upholstery goods,				
Gimps,				
Plushes,				
Woolen yarns,				
Hosiery and knit goods,				
Hosiery,				
Hosiery,				
Carpets,				
Ingrain carpets,				
Cigars,				
Carpet yarns,				
Ingrain carpets,				
Hosiery,				
Hosiery and underwear,				
Ginghams,				
Cotton yarns,				

PHILADELPHIA, PA.—Continued.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.			Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12.	12 to 16.			
Mero Fruit Jar Company,	Fruit jars,	248	123	..	70	Sept. 26.		
Oxford Knitting Mills,	Cardigan jackets,	56	134	..	3	Sept. 27.		
Gill & Co.,	Flint and colored glass,	263	12	..	21	Sept. 27.		
Hoeflich & Wilson,	Carpets,	25	25	..	..	Sept. 28.		
W. F. Short,	Hosiery,	14	90	..	30	Sept. 29.	Guard pulley and belt on second floor.	
Richmond Hosiery Mills,	Hosiery,	44	86	..	30	Sept. 29.		
A. Schoenhut & Co.,	Toy pianos and novelties, . . .	45	15	..	27	Oct. 3.		
A. Schoenhut & Co.,	Toy pianos and novelties, . . .	56	..	..	26	Oct. 3.		
Jefferson Flint Glass Works, . . .	Globes and chimneys,	260	15	..	60	Oct. 5.		
D. H. Stroud,	Draperies and curtains,	59	16	..	2	Oct. 5.		
Kirk & Barnes,	Cotton and woolen goods, . . .	25	..	..	1	Oct. 6.		
Welcome Manufacturing Co., . . .	Tickings,	7	10	..	..	Oct. 6.		
E. Wilkinson,	Cotton and woolen goods, . . .	10	30	..	..	Oct. 6.		
Joseph Thurman,	Shawls and knit goods,	4	19	..	1	Oct. 11.		
Sherman Carpet Mills,	Carpets,	50	80	..	..	Nov. 14.		
Mrs. S. G. Atemus,	Gowns,	3	77	..	..	Nov. 16.	Post time slips, and comply with section 11.	
Nathan Miller,	Ingrain carpets,	18	8	..	2	Nov. 17.		
Samuel R. Read,	Ladies' shoes,	18	9	..	3	Nov. 17.		
Hyndman & Moore,	Chenille curtains,	26	76	..	8	Nov. 17.	Comply with section 7.	
Wanetah Mills,	Ingrain carpets,	17	43	..	..	Nov. 21.		

Allegheny Worsted Mills,	Worsted yarns,	70	30	21	Good.	Nov. 23.	
Murray Flint Glass Works,	Globes and chimneys,	225	25	54	Fair.	Nov. 23.	
TACONY, PHILADELPHIA, PA.							
Tacony Worsted Mills,	Worsted yarns,	100	90	55	Good.	July 12.	Place automatic closings at each elevator way.
GLADWYNE, MONTGOMERY COUNTY, PA.							
Rose Glen Mill,	Carpet yarns,	25	7	5	Good.	April 19.	Comply with sections 2, 3 and 8.
CHESTER, DELAWARE COUNTY, PA.							
Phenix Woolen Mills,	Worsted cloth,	50	60	12	Bad	April 20.	Comply with sections 3 and 10,
Aberfoyle Manufacturing Co.,	Fine textile fabrics,	175	125	23	Fair.	April 20.	Place automatic closings at elevator on each floor; have water closets flushed and disinfected.
L. A. Crozer & Son,	Cotton yarn,	32	40	8	do.	April 25.	Provide wash-rooms and erect new water closets.
Lansdowne Textile Mills,	Cotton goods,	90	60	11	Good.	April 25.	Comply with sections 2, 7 and 8,
Lincoln Manufacturing Company,	Cotton wraps,	55	50	13	do.	April 25.	Comply with sections 2, 3 and 7,
Shaw, Esrey & Co.,	Woolens,	164	150	21	Fair.	April 27.	Comply with sections 8 and 10 and place platform in front of female water closet in mill No. 1.
Chester Manufacturing Company,	Turkish red damask and cotton yarns.	93	132	14	do.	April 28.	Comply with section 3 and provide wash-room for females.
Patterson Mills Company,	Cotton goods,	145	180	18	do.	May 3.	Comply with sections 2 and 3,
James Bowers' Sons,	Wool shoddies,	25	10	...	do.	May 3.	Comply with sections 1, 3, 7, 10 and 12,
James Irving & Son,	Jeans, tweeds and cassimeres,	75	50	12	Good.	May 5.	Erect additional fire escape,
Fairview Worsted Mills,	Worsted yarns,	13	58	24	do.	May 5.	Comply with sections 2 and 3,

CHESTER, DELAWARE COUNTY, PA.

CHESTER, PA.—Continued.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.				Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12.	12 to 16.				
South Chester Manufacturing Company.	Cotton and woolen goods, . .	35	36	..	6	Fair,	May 9,		Complied.
Auvergne Mills,	Cotton goods,	40	40	..	13	do.	May 9,	Comply with sections 2, 3, 10 and regularly empty and renew barrels of water used for fire purposes.	Complied.
Standard Spinning Company, . . .	Cotton yarns,	32	18	..	8	Good,	May 9,	Comply with sections 8 and 10,	Complied.
George C. Hetzel & Co.,	Worsted and woolen goods, . .	100	200	..	21	do.	May 9,	Comply with sections 2 and 3. guard crank-arm of engine and place foot-walk from factory to water closet.	Complied.
Simeon Cotton,	Cotton yarns,	10	40	..	15	do.	May 12.	Comply with sections 2, 3 and place bell on elevator.	Complied.
Ryam Manufacturing Company,	Cotton and woolen goods, . .	34	32	..	7	Bad,	May 12,	Comply with sections 2, 3, 11, place walk from factory to females' water closet and erect new water closet for male employees.	Complied.
James Irving & Son,	Tweeds, jeans and cassimeres,	75	34	..	13	Good,	Nov. 22.		

UPLAND, DELAWARE COUNTY, PA.

Samuel A. Crozer & Son,	Cotton goods,	134	266	..	33	Good,	April 22,	Place certificates on file: provide safety enclosures about small elevators on each floor opening; box belt; cover pulley head of driving shaft and designate water closets.	Complied.
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SWARTHMORE, DELAWARE COUNTY, PA.

A. P. Lewis,	Cotton goods,	37	28	5	Good.	May	5.	Comply with sections 2, 3 and 10, and place guard rail on side of spreading machine.	Complied.
A. P. Lewis,	do.	32	26	5	do.	Nov.	22.		

CLIFTON HEIGHTS, DELAWARE COUNTY, PA.

Thomas Kent Manufacturing Co.,	Woolen goods,	124	86	35	Bad.	Feb.	3.	Comply with sections 1, 2, 3, 7, 8, 10 and 12.	Complied.
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DARBY, DELAWARE COUNTY, PA.

Griswold Worsted Co.,	Silk worsteds,	145	264	112	Good.	April	7.	Comply with section 10, and place railing on stairs.	Complied.
Dauntless Yarn Mills,	Woolen yarns,	16	9	10	Fair.	April	8.	Comply with sections 2, 3 and 10, and place railing round crank of engine.	Complied.

NICETOWN, PHILADELPHIA, PA.

Geo. Schmidt & Bro.,	Hosiery,	16	34	6	Fair.	July	18.	Place partition in front of both water closets.	Complied.
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ACCIDENT REPORTS OF MRS. BELLE MCENÉRY—FIRST DISTRICT.

PHILADELPHIA, PA.

Date of accident.	PERSONS INJURED.	Age.	Establishment in which accident occurred.	Location.	Machine, etc., on which accident occurred.	Particulars and extent of injury.
1892.						
Dec. 5,	William Daily, . . .	38	Burnham, Williams & Co. . . .	Philadelphia,	Belting and shafting,	C caught between belt and shafting while putting belt on in boiler shop; arm broken.
Dec. 10,	F. C. Dyer,	17	Finley & Co.,	Crescentville,	Boring frame,	Fore finger of lefthand partly crushed while oiling machinery.
Dec. 21,	Thomas Fahey, . .	16	William Mann Company,	Philadelphia,	Envelope press,	Was caught in a gripper; knee bruised.
Jan. 9,	Wm. Stelgleman, .	32	Burnham, Williams & Co.,	do. . . . .	. . . . .	Bolt breaking while hoisting some machinery, he was hurt about the head and died on the way to the hospital.
Jan. 25,	Frank Edgar,	29	do.	do. . . . .	. . . . .	Compound fracture of skull caused by the falling of counter shafting, striking him on the head. He died next day.
27,	R. Jameson,	46	Robert Mitcheson,	do.	Circular saw,	Accidental; thumb cut.
Feb. 10,	August Sommers, .	16	McNeely Company,	do.	Elevator,	Slipping on the elevator; foot jammed.
Feb. 16,	Daniel Jordan, . . .	27	Burnham, Williams & Co.,	do. . . . .	. . . . .	Explosion of benzine; killed.
Feb. 16,	Sylvester Hester, .	45	do.	do. . . . .	. . . . .	Leg and collar bone fractured and burnt, caused by explosion of benzine.
Feb. 16,	Pat Kenny,	32	do.	do. . . . .	. . . . .	Arm fractured and burnt by the explosion of benzine.
Feb. 26,	J. Hilton,	58	Robert Mitcheson,	do.	Circular saw,	Finger cut on circular saw, caused from lack of judgment.
March 3,	Chas. H. Rementer, .	. . .	William Woods Co.,	do.	Boiler,	Scalded on back and limbs by opening boiler without making sure that it was empty.

March 3,	Dominick McColgar,	23	do.	do.	Scalded on instep of foot by escaping steam.
April 2,	Henry Charlton,	40	Robert Mitcheson,	do.	Struck by a piece of wood from saw, from which he died.
April 4,	John Lyons,	25	Burnham, Williams & Co.,	do.	Steam hammer slipped and struck him on the head; no serious results.
April 7,	Phillip Hest,	35	Erben Search & Co.,	Tacony,	While shifting belt his foot slipped, causing him to fall and break one bone in the forearm.
April 20,	Adolph Kamp,	16	Hoopes & Townsend,	Philadelphia,	Laceration of right index finger; caused by sharpening tools on wheel (grind stone).
April 25,	Geo. W. Brown,	49	McNeely & Co.,	do.	Fell down elevator shaft and was killed.
April 28,	Katie Barry,	17	Erben Search & Co.,	Tacony,	Started machine while cleaning it; flesh of arm badly cut.
April 30,	Thos. Plunkett, . . . . .	...	John Gay's Sons,	Philadelphia,	Arm caught between gum rollers; extent of injury not known.
May 9,	Samuel Sprecht,	33	Hoopes & Townsend,	do.	Iron bar fell on him, causing a fracture of the right metatarsal bone.
May 11,	Michael Kelley,	27	H. Diston & Sons,	Tacony,	Jumped up to catch rope attached to window in skylight; ankle on right limb broken.
May 21,	Geo. W. Newman,	23	Wanamaker & Brown,	Philadelphia,	Died from falling down elevator well.
May 31,	Wm. Brenners,	24	John Mundell & Co.,	do.	Carelessness; crushed finger.
June 11,	Martin Gillen,	19	Thos. Henry & Sons,	do.	Lost part of one finger of right hand while cleaning mule head while in motion.
June 12,	Aug. Lohbrandt,	42	Burnham, Williams & Co.,	do.	Fell from trestle while taking clamps off of belt; ribs broken, collar bone fractured and ankle injured.
June 30,	Nellie O'Connell,	15	Barnes-Erb Laundry Company,	do.	Carelessness; ends of two fingers pinched.
July 19,	Thos. Mullineaux,	35	John Wanamaker,	do.	Fell from elevator; was picked up dead.
July 22,	Benjamin Anderson,	45	Burnham, Williams & Co.,	do.	Removing machinery; scalp wound.
July 25,	Wm. Sullivan,	16	do.	do.	Dropped a check under elevator and was caught in a kneeling position; slight contusion of spleen and both knees.

ACCIDENTS—Continued.

Date of accident.	PERSONS INJURED.	Age.	Establishment in which accident occurred.	Location.	Machine, etc., on which accident occurred.	Particulars and extent of injury.
July 25,	F. Schweltzer, . . .	45	Hoopes & Townsend,	Philadelphia,	. . . . .	Heat stroke.
July 28,	A. Lambolt, . . . . .	. . .	do.	do.	. . . . .	Finger badly lacerated by broken glass.
July 28,	Craig Baker,	45	do.	do.	. . . . .	Heat stroke.
July 29,	Henry Nixon,	14	H. Disston & Sons,	do.	Polishing machine,	While engaged in sweeping he struck the belt which was lying loose on the shaft, thereby causing it to lap and upset the machine; slight scalp wound.
Aug. 8,	Jas. Harris,	18	Hoopes & Townsend,	do.	. . . . .	Left leg and foot scalded; caused by slipping and stepping into a basin of boiling water.
Aug. 14,	Rose Albright,	24	Erben Search & Co.,	do.	Finishing frame,	Two fingers of right hand caught in frame; carelessness.
Aug. 20,	Mary Schaffer,	18	Thos. Dolan & Co.,	do.	Twisting machine,	Lost one finger on right hand by cleaning machine while in motion.
Sept. 9,	John Straelbach,	45	Hoopes & Townsend,	do.	. . . . .	Laceration and contusion of left foot; caused by bar of iron falling on it.
Sept. 14,	Max Steln,	19	Thos. Dolan & Co.,	do.	Carding machine,	Cut overeye; caused by carelessness.
Sept. 23,	Frank Bauers,	15	Smith & Peters,	do.	Beltng,	Loss of left arm; carelessness.
Sept. 23,	Adam Leonowitch,	48	Hoopes & Townsend,	do.	Tumbler,	Contusion of loins and back by falling over the machine.
Sept. 25,	Geo. H. Tyldsley,	15	Dornan Bros.,	do.	Carpet power loom,	Lost part of right hand by not attending to his own work.
Oct. 5,	Hugh Bell,	19	Thos. Dolan & Co.,	do.	Mixing picker,	Lost one joint of fore finger of left hand; accidental.
Oct. 18,	Abraham Simock,	51	Erben Search & Co.,	do.	Steam pump,	Lost part of first finger of left hand, hand caught in cogs; carelessness.

Nov. 5,	Ernst Wilde,	20	Hoopes & Townsend,	do.	. . . . .	. . . . .	Fell from ladder, injury apparently trifling.
Nov. 7,	Harvey Maguire,	29	Langfeld Bros. & Co.,	do.	. . . . .	Embossing press,	Carelessly holding hand under the moving plates; left hand severely burned.
Nov. 17,	Carrie Breckley,	18	Wm. B. Warner & Co.,	do.	. . . . .	Gearing,	Lost part of one finger, her own carelessness.
Nov. 19,	Patrick McLaughlin,	30	Burnham, Williams & Co.,	do.	. . . . .	Rip saw,	Two fingers cut off and two others badly cut, his foot slipped and he fell forward on saw.
Nov. 22,	H. S. Shroeder,	24	Hoopes & Townsend,	do.	. . . . .	. . . . .	Caught finger in machine; lost part of same.
Nov. 22,	Michael McKeone,	16	do. do.	do.	. . . . .	. . . . .	Lost three fingers by throwing water into the machine (playfully) and trying to extract it again.
Nov. 25,	Robt. Simpson,	30	S. S. White Dental Company,	do.	. . . . .	Explosion of illuminating gas	Injured in back.
Nov. 25,	Geo. Pearson,	43	do. do.	do.	. . . . .	do. do.	Bruised and shocked.
Nov. 25,	E. M. Whitacar,	25	do. do.	do.	. . . . .	do. do.	Bruised and shocked.
Nov. 25,	Wm. A. Huff,	28	do. do.	do.	. . . . .	do. do.	Badly bruised and cut.
Nov. 25,	Lyman Lull,	45	do. do.	do.	. . . . .	do. do.	Wrist broken and otherwise injured.
Nov. 25,	Thos. W. Riday,	60	do. do.	do.	. . . . .	do. do.	Bruised and shocked.
Nov. 25,	Mary Crangle,	38	do. do.	do.	. . . . .	do. do.	Hands badly cut.
Nov. 25,	Robert Fiek,	25	do. do.	do.	. . . . .	do. do.	Bruised and shocked.
Nov. 25,	R. C. Adams,	65	do. do.	do.	. . . . .	do. do.	Bruised and shocked.
Nov. 25,	Wm. H. Cottman,	60	do. do.	do.	. . . . .	do. do.	Bruised and shocked.
Nov. 25,	Harry Morad,	30	do. do.	do.	. . . . .	do. do.	Injured internally.
Nov. 25,	Wm. Jones,	45	do. do.	do.	. . . . .	do. do.	Bruised and shocked.
Nov. 25,	Chas. Baky,	18	Hoopes & Townsend,	do.	. . . . .	. . . . .	Laceration of right leg by falling through vault in the yard.

REPORTS OF MRS. BELLE MCENERY—FIRST DISTRICT—FOR THE YEAR 1892.
PHILADELPHIA, PA.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.			Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12. 12 to 16.				
T. J. Dunn,	Cigars,	290	60	. . .	Good,	Dec. 1.		
Breuker & Kenler,	Printing,	42	4	16	do.	Dec. 1.		
Lazarus & Lipper,	Trimnings,	125	200	74	Bad.	Dec. 1.	Comply with sections 9, 18, and provide water closets for females.	Complied.
Baptist Publishing Society,	Printing,	30	80	. . .	Good,	Dec. 2.		
Gumpert Bros.,	Cigars,	200	400	39	Bad,	Dec. 2.		
M. W. Lipper,	Trimnings,	200	400	69	do.	Dec. 2.	One additional closet ordered,	Complied.
Wright Bros.,	Parasols,	165	380	55	do.	Dec. 3.		
Lewtlyn & Co.,	Drugs,	14	6	5	Good,	Dec. 3.		
McNeely & Co.,	Mowers,	680	. . .	125	do.	Dec. 3.	Gates to elevator,	Complied.
William Hoskins,	Printing,	71	37	. . .	do.	Dec. 4.		
Henry B. Ashmead,	do.	33	12	4	do.	Dec. 4.	Designate water closets,	Complied.
Presbyterian Board Publication,	Publishing,	40	10	. . .	do.	Dec. 4.	Designate water closets,	Complied.
Burk & Fetridge,	Blank books,	86	4	12	do.	Dec. 5.		
Follmer, Clogg & Co.,	Parasols,	100	300	33	do.	Dec. 5.		
Stanley G. Flag,	Iron works,	480	. . .	14	do.	Dec. 5.		
John Mundell & Co.,	Shoes,	250	300	150	do.	Dec. 7.		
Hayes Partridge Shoe Company,	do.	100	50	15	do.	Dec. 7.		
J. W. Collins,	Printing,	35	10	11	do.	Dec. 7.		

PHILADELPHIA, PA.—Continued.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.				Sanitary condition.	Date of inspection.	Orders given.	Compliance.	
		Males.	Females.		Under 12.					12 to 16.
Hillier & Co.,	Shirts,	8	30	. . . . .	. . . . .	Good.	Dec. 21.		
Boyl & Boden,	Neckwear,	14	6	. . . . .	5	do.	Dec. 21.		
Hallahan Bros.,	Shoes,	75	75	. . . . .	. . . . .	do.	Dec. 21.		
T. Lallor,	Dry goods,	35	15	. . . . .	. . . . .	do.	Dec. 22.		
G. A. Swartz,	Toys,	15	15	. . . . .	. . . . .	do.	Dec. 22.		
J. B. Shepherd,	Dry goods,	60	60	. . . . .	11	do.	Dec. 22.		
McCallum & Sloan,	Carpets,	125	35	. . . . .	6	do.	Dec. 22.		
Reed's Sons,	Clothing,	335	15	. . . . .	22	do.	Dec. 23.		
G. W. Miles,	Millinery,	7	43	. . . . .	. . . . .	do.	Dec. 23.		
G. Allen,	do.	5	45	. . . . .	13	do.	Dec. 23.		
H. Varwig,	Plush cases,	17	18	. . . . .	. . . . .	do.	Dec. 24.		
Porter & Coates,	Books,	37	3	. . . . .	15	do.	Dec. 24.		
Caldwell & Co.,	Jewelry,	105	15	. . . . .	. . . . .	do.	Dec. 24.		
John F. Orne,	Carpets,	55	15	. . . . .	. . . . .	do.	Dec. 24.		
Bowker & Swahn,	Neckwear,	20	15	. . . . .	. . . . .	do.	Dec. 28.		
S. M. Wannemaker,	Clothing,	300	50	. . . . .	18	do.	Dec. 28.		
Blaylock & Blynn,	Hats,	12	9	. . . . .	. . . . .	do	Dec. 28.		
W. H. Hosking,	Stationery,	75	40	. . . . .	. . . . .	do.	Dec. 29.		
G. H. Allen,	Millinery,	15	43	. . . . .	. . . . .	do.	Dec. 29.		
F. G. Whitman,	Chocolates,	13	6	. . . . .	5	do.	Dec. 29.		

Granville B. Haines,	Dry goods,	125	275	..	79	do.	Dec. 29.
Sharpless Bro.,	do.	200	200	..	40	do.	Dec. 30.
John & James Dobson,	Carpets,	60	15	..	1	do.	Dec. 30.
Miles Bros.,	Shoes,	60	20	..	..	do.	Dec. 30.
Ivins, Deltz & Magee,	Carpets,	11	289	..	16	do.	Dec. 31.
Morse Baking Company,	Baking,	10	15	..	..	do.	Dec. 31.
Le Boutillier & Co.,	Dry goods,	125	175	..	39	do.	Dec. 31.
Partridge & Richardson,	Notions,	70	280	..	55	do.	Dec. 31.
Kaufman & Reuben,	Underwear,	5	120	..	..	do.	Jan. 4.
A. J. Holman,	Bibles,	125	75	..	24	do.	Jan. 4.
Mrs. A. J. Parker,	Straw works,	10	50	..	..	do.	Jan. 5.
Geo. Harris & Son,	Printing,	95	290	..	46	do.	Jan. 5.
F. W. Maurer,	Trimnings,	25	250	..	25	do.	Jan. 6.
Pennsylvania Cloak Company,	Cloaks,	42	38	..	..	do.	Jan. 6.
Jos. Potter,	Straw works,	10	150	..	20	do.	Jan. 7.
Forbes Publishing Company,	Printing,	25	150	..	..	do.	Jan. 7.
W. G. Ellis,	Hostery,	15	135	..	23	do.	Jan. 7.
W. B. Kiley,	Horse clothing,	20	60	..	23	do.	Jan. 7.
W. Ayers,	Woolens,	200	100	..	6	do.	Jan. 8.
W. H. Horstman,	Trimnings,	220	380	..	125	do.	Jan. 8.
Ziegler Bros.,	Shoes,	250	200	..	14	do.	Jan. 8.
Strawbridge & Clothier,	Dry Goods,	1,200	800	..	500	do.	Jan. 11.
Wanamaker & Brown,	Clothing,	480	20	..	20	do.	Jan. 11.
Strunk & Vansant,	Artificial flowers,	2	18	..	7	do.	Jan. 12.
Falcon Hostery Mills,	Hostery,	20	60	..	24	do.	Jan. 12.
Daniel's Bros.,	Millinery,	5	30	..	..	do.	Jan. 13.
Mammoth Five Cent Store,	Notions,	25	125	..	48	do.	Jan. 13.
D. N. Custer,	Millinery,	10	140	..	20	do.	Jan. 13.
Cook & Bro.,	Hostery,	25	50	..	25	do.	Jan. 14.

PHILADELPHIA, PA.—Continued.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.				Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12.	12 to 16.				
Julius L. Sichel,	Millinery,	40	150	.	55	Good.	Jan. 14.		
Hensel, Colladay & Co.,	Trimnings,	100	400	.	125	do.	Jan. 15.		
J. & L. Baxter,	Shirts,	15	125	.	.	do.	Jan. 15.		
Shoneman Bros.,	Fancy goods,	16	100	.	35	do.	Jan. 15.		
Marks Bros.,	Dry goods,	90	275	.	45	do.	Jan. 15.		
Technor & Co.,	Hats,	49	25	.	4	do.	Jan. 18.		
Carey Bros.,	Wall paper,	244	16	.	50	do.	Jan. 18.		
Freedman Levi & Co.,	Coats,	80	30	.	1	do.	Jan. 19.		
Ed. Darby & Sons,	Wire goods,	73	12	.	5	do.	Jan. 19.		
J. M. Hansell's Sons,	Printed envelopes,	10	25	.	2	do.	Jan. 20.		
Wm. Chapman,	Shoes,	40	18	.	4	do.	Jan. 20.		
Geo. W. Plumly,	Paper boxes,	50	300	.	88	do.	Jan. 20.		
W. G. Allen & Co.,	Coats,	62	13	.	.	do.	Jan. 21.		
Wienlander & Co.,	Parasols,	15	25	.	.	do.	Jan. 21.		
Snyder, Harris & Co.,	Clothing,	56	12	.	.	do.	Jan. 22.		
Master Detwiler & Co.,	Coats,	46	14	.	.	do.	Jan. 25.		
Chas. W. Mincke,	Clears,	20	10	.	3	do.	Jan. 25.		
Wanamaker & Brown,	Clothing,	482	18	.	15	do.	Jan. 26.		
Marks Bros.,	Dry goods,	160	340	.	134	do.	Jan. 26.		
Luberg Manufacturing Company, .	Upholstery,	120	10	.	3	do.	Jan. 26.		

Strawbridge & Clothier,	Dry goods,	1,200	800	500	do.	Jan. 27.	
John Wanamaker,	do.	2,000	2,300	500	Fair,	Jan. 27,	Disinfect water closet,
David Henly,	Artificial flowers,	15	165	50	Good,	Jan. 28.	Completed.
Jos. Adamson,	Braids,	150	25	27	Fair,	Jan. 28.	
Wm. Woods & Co.,	Woolens and cottons,	600	600	319	Bad,	Jan. 28,	Comply with sections 7, 9, 10 and 18,
McNeely & Co.,	Morocco,	600	500	50	Good,	Feb. 1.	Completed.
Henry H. Shelp & Co.,	Cigar boxes,	171	54	8	do.	Feb. 1.	Designate water closets,
Deelmore Manufacturing Co.,	Novelty dress goods,	75	50	3	Bad,	Feb. 1,	Comply with sections 9, 10 and 18,
G. W. Brooke,	Turkish towels,	20	15	10	Fair,	Feb. 2.	Comply with sections 9, 10 and 18,
The Way Dyeing Company,	Dyeing,	45	25	8	Good,	Feb. 2.	Designate water closets,
J. B. Boyd & Bro.,	Ladies' underwear,	10	80	3	do.	Feb. 2.	Erect fire escape,
Jos. Welsh,	Cottons and woolens,	25	25	5	Fair,	Feb. 3.	Comply with sections 9, 10 and 18,
Jos. Adamson & Co.,	Webbing,	35	125	25	do.	Feb. 8.	Comply with sections 9, 10 and 18,
T. J. Dunn,	Tobacco,	200	60	5	Fair,	Feb. 8.	Completed.
Gumpert Bros.,	Cigars,	200	400	60	Good,	Feb. 9.	
Wright & Bros.,	Parasols,	165	380	55	Fair,	Feb. 9.	
Presbyterian Board of Publication,	Publishing,	40	10	5	Good,	Feb. 10.	
H. B. Ashmead,	Printing	33	12	7	do.	Feb. 10.	
W. H. Hoskins,	Stationery,	151	37	12	do.	Feb. 11.	
Lazarus & Lepper,	Buttons,	125	200	23	do.	Feb. 11.	
Hirsh & Bro.,	Parasols,	250	400	85	do.	Feb. 12.	
Bolton Quilt Mills,	Quilts,	35	25	16	Bad,	Feb. 16,	Comply with sections 1, 2, 3, 9, 10, 11, 12 and 18,
Thos. Cares & Sons,	Carpets,	55	125	2	do.	Feb. 16,	Comply with sections 9, 10, and 18,
George W. Enlen,	Cloths,	10	25	4	Good,	Feb. 16,	Post notices and repair water closets, . . .
Robert J. Thomson,	Tailoring,	155	65	35	Fair,	Feb. 17,	Comply with sections 9, 10 and 18,
Joseph Murphy,	Woolens and cottons,	150	450	220	Good,	Feb. 18.	Completed.
William Woods & Co.,	Woolens,	600	600	220	do.	Feb. 19.	
John B. Stetson & Co.,	Hats,	430	470	50	do.	Feb. 23.	Post notices and designate water closets, . .
Robert Mitcheson,	Pipes,	50	25	5	do.	Feb. 23.	Completed.

PHILADELPHIA, PA.—Continued.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.				Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12.	12 to 16 years.				
M. Elkins & Co.,	Shoes,	100	50	..	4	Good.	Feb. 24.		
E. H. Godshalk,	Trimnings,	560	40	..	11	do.	Feb. 24.		
William Munier,	Neckwear,	20	60	..	3	do.	Feb. 24.		
Fleck & Duck,	Yarns,	200	80	..	35	do.	Feb. 25.		
Franklin Print Co.,	Printing,	61	9	..	2	do.	Feb. 25.		
James Arnold,	do.	25	15	..	..	do.	Feb. 26.		
Thomas L. Lallor,	Shawls,	7	11	..	..	Fair.	Feb. 29.		
Alex. Erskine,	do.	6	10	..	1	do.	Feb. 29.		
T. M. Wanamaker,	Neckwear,	210	40	..	25	Good.	Mar. 1.		
G. Daniels,	Shirts,	2	78	..	..	do.	Mar. 1.		
George DeB. Keim,	Horse clothing,	70	30	..	..	Good.	Mar. 2.		
Dress Making Parlors,	Dress making,	1	19	..	..	Fair.	Mar. 2.		
James Boyd & Bro.,	Underwear,	30	90	..	2	Good.	Mar. 7.		
Snellenberger & Co.,	Clothing,	400	..	..	28	do.	Mar. 7.		
F. W. Wolfe,	Parasols,	10	20	..	1	Fair.	Mar. 8.		
William D. Munter,	Neckwear,	20	60	..	15	do.	Mar. 9.		
J. & L. Baxter,	Artificial flowers,	15	135	..	..	Good.	Mar. 10.		
Lanfield Bros.,	Leather goods,	200	250	..	7	do.	Mar. 10.		
Boyer & Dungan,	Millinery,	23	10	..	4	do.	Mar. 10.		
Schute,	Laboratory,	43	15	..	..	do.	Mar. 11.		
								Comply with section 10.	Complied.

Mrs. L. C. Baur,	Artificial flowers,	1	19	. . . . .	do.	Mar. 11.	
Belmont Knitting Mills,	Knitting Mills,	5	35	. . . . .	do.	Mar. 11.	
William Woods & Co.,	Woolen goods,	600	600	. . . . .	do.	Mar. 12.	
John Ditman,	Laundry,	2	16	. . . . .	do.	Mar. 12.	
J. D. Orne,	Yarns,	3	47	. . . . .	do.	Mar. 12.	
Ab Kirchbaum,	Clothing,	410	90	. . . . .	do.	Mar. 16.	Compld. Comply with sections 7, 9 and 10 and erect fire escape.
Henry H. Shelp & Co.,	Cigar boxes,	171	54	. . . . .	do.	Mar. 18.	
Moore Alpaca Company,	Dress goods,	71	54	. . . . .	do.	Mar. 18.	
George W. Brooke,	Turkish towels,	20	15	. . . . .	do.	Mar. 18.	
Way Dyeing Co.,	Dyeing,	45	25	. . . . .	do.	Mar. 18.	
Dress Making Parlors,	Dress making,		25	. . . . .	do.	Mar. 19.	
Charles J. Cohen,	Envelopes,	4	21	. . . . .	Fair.	Mar. 19.	Compld. Disinfect water closets,
John Adamson,	Webbing,	35	125	. . . . .	Good.	Mar. 19.	
Joseph Welsh,	Cottons and woolens,	25	25	. . . . .	do.	Mar. 19.	
Peter Woll & Sons,	Curled hair,	108	17	. . . . .	Fair.	Mar. 21.	Compld. Disinfect water closets,
A. J. Holman,	Bibles,	125	75	. . . . .	Good.	Mar. 21.	Compld. Keep record book,
Frishmuth Bro. & Co.,	Tobacco,	15	160	. . . . .	do.	Mar. 22.	Compld. Comply with sections 9 and 10,
Park Carpet Mills,	Carpets,	100	125	. . . . .	do.	Mar. 22.	Compld. Designate water closets,
R. Henry,	Yarns,	22	. . . . .	. . . . .	do.	Mar. 23.	
Wm. Holmis & Sons,	Cloths,	18	7	. . . . .	do.	Mar. 23.	Compld. Designate water closets,
H. B. Thomas,	Woolens,	3	12	. . . . .	do	Mar. 24.	Compld. Designate water closets,
Porter & Diekey,	Carpets,	65	135	. . . . .	do.	Mar. 24.	
B. Hooley & Son,	Printing,	15	42	. . . . .	do.	Mar. 25.	
Henry H. Roelofs & Co.,	Hats,	135	80	. . . . .	do.	Mar. 25.	
Burk & McFetridge,	Printing,	115	10	. . . . .	do.	Mar. 25.	
Hoopes & Townsend,	Castings,	560	. . . . .	. . . . .	do.	Mar. 25.	
Baldwin Locomotive works,	Locomotives,	4,500	. . . . .	. . . . .	do.	Mar. 25.	
E. Vaughan,	Hosiery,	31	60	. . . . .	Fair.	Mar. 25.	Compld. Designate water closets,

PHILADELPHIA, PA.—Continued.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.				Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12.	12 to 16.				
Lykens Bros.,	Carpets,	27	12	..	4	Good,	Mar. 23,	Designate water closets,	Complied.
Brown Bros. Aberle Co.,	Hosiery,	50	250	..	105	Fair.	Mar. 30,	Box three shafts,	Complied.
J. H. A. Klauber,	Jersey goods,	10	125	..	14	Good,	April 1,	Designate and partition water closets and box shaft.	Complied.
John Scanlan & Son,	Carpets,	15	185	..	1	Fair,	April 4.		
Fred. Rumpf & Bro.,	Table cloths,	110	40	..	5	do.	April 4.		
Chas. Illingsworth,	Glazed kid,	90	..	..	25	do.	April 5.		
Ferdinand Werner,	Ingrain carpets,	32	..	..	6	Good,	April 6.		
Dickey & McMaster,	Carpets,	32	10	..	1	Fair,	April 7.		
Putnam Carpet Company,	do.	75	75	..	58	do.	April 11.		
O'Neill Bros.,	Cotton and woolen waste,	18	10	..	..	do.	April 14,	Designate water closets,	Complied.
Thos. Derlin's Sons,	Carpets,	50	50	..	7	do.	April 14,	Designate water closets,	Complied.
Continental Knitting Mills,	Knitting mill.	30	80	..	..	Good,	April 15,	Box two shafts and guard near machines, designate water closets, and report acci- dents.	Complied.
Star Carpet Mills,	do.	90	90	..	4	do.	April 15.		
Columbia Carpet Mills,	do.	33	15	..	3	do.	April 15.		
A. J. Holman,	Bibles,	200	75	..	25	do.	April 18.		
Wm. Woods,	Cotton and woolen goods,	600	600	..	125	do.	April 19.		
Erben Search & Co.,	Yarns,	200	500	..	69	do.	April 19.		
Star Brad Mills,	Braids,	100	250	..	62	Fair,	April 20.		

H. Diston & Sons,	Saws,	320	305	Good,	April 20.
Philadelphia Gimp Mill,	Gimps,	450	74	Fair,	April 21.
Park Carpet Mill,	Carpets,	210	7	Good,	April 22.
Frimuth & Bro.,	Tobacco,	160	7	do.	April 22.
Ab. Kirchbaum,	Clothing,	90	25	do.	April 25.
Wm. Woods & Co.,	Woolens,	600	125	do.	April 26.
Park Carpet Mills,	Carpets,	210	31	do.	April 27.
Brown Bros. Aberle Co.,	Hosiery,	250	105	do.	April 28.
J. H. Klander,	Quilts,	125	14	do.	April 29.
Follmer, Clogg & Co.,	Parasols,	280	. . .	do.	May 2.
Croxton, Wood & Co.,	Shoes,	40	1	do.	May 3.
Thos. A. Pearce,	Hosiery,	300	35	do.	May 4.
Stephen Whitman,	Chocolates,	50	30	do.	May 5.
Western Union Telegraph Co.,	Telegrams,	200	1,000	do.	May 6.
Boyer, Evans & Co.,	Bag factory,	20	12	Fair,	May 9.
John Croxton,	Paper boxes,	40	12	do.	May 9.
Heidelberger, Frank & Co.,	Fancy goods,	75	23	do.	May 10.
D. Jayne & Son,	Laboratory,	60	28	do.	May 11.
Thos. Price,	Envelopes,	25	18	do.	May 12.
C. & G. Sassman,	Hosiery,	110	36	do.	May 13.
Wanamaker & Brown,	Clothiers,	25	15	Fair,	May 13.
Wilson Biscuit Company,	Crackers,	80	48	do.	May 14.
Blum Bros.,	Cloaks,	100	. . .	Good,	May 16.
Thomas Dolan & Co.,	Woolens,	100	51	Fair,	May 16.
Belknap & Johnson,	Parasols,	150	47	Good,	May 17.
J. & L. Baxter,	Artificial flowers,	125	40	do.	May 17.
Brown, Bailey & Co.,	Paper boxes,	28	11	Fair,	May 18.
G. A. Bisler,	do.	100	25	do.	May 18.
Bachelor Bros.,	Cigars,	30	8	Good,	May 19.

PHILADELPHIA, PA.—Continued.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.			Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12. 12 to 16.				
A. Bernstein.	Trimmings.	100	16	..	Fair.	May 19.		
Belmont Knitting Mills.	Worsted,	80	40	..	Good.	May 19.		
Elliott and Mallory.	Cards.	3	17	..	Fair.	May 20.		
Dunlap & Clark.	Printing.	100	20	..	Good.	May 20.		
Keystone Watch Case Company.	Watch cases.	775	325	..	Fair.	May 20.		
Continental Manufacturing Co.,	Muclage.	7	8	..	do.	May 23.		
Cook & Bro..	Hosiery and underwear.	25	50	..	do.	May 24.		
Croxton, Wood & Co.,	Shoes.	100	40	..	do.	May 25.		
Thomas Carlick.	Crackers.	56	..	..	do.	May 26.		
James Cotter.	Shoes.	100	40	..	do.	May 28.		
W. H. Horstman.	Badges, etc.,	250	350	..	do.	May 31.		
J. W. Collins.	Printing.	45	10	..	do.	May 31.		
Merz & Hagenmank.	Shirts.	200	300	..	do.	June 1.		
E. C. Howlett & Sons.	Paper bags.	24	16	..	Good.	June 1.		
D. W. Hutton.	Shirts.	10	25	..	Fair.	June 2.		
C. N. Hill.	Shoes.	30	50	..	do.	June 2.		
Harris & Henderson.	do.	160	15	..	do.	June 3.		
Hensell, Collday & Co.,	Trimmings.	100	400	..	do.	June 3.		
W. A. Haines.	Leather good.	15	35	..	Good.	June 4.		
F. Hassler.	Parasols.	10	15	..	Fair.	June 4.		

Ochrel Bros. & Co.,	Upholstery.	35	40	12	do.	June 13.	Provide proper wash rooms and water closets for females; keep the same screened, clean, ventilated and designated.	Complied.
Daniels Bros.,	Millinery,	5	30	..	do.	June 14.		
Bailey's Five-cent Store,	Notions,	45	80	25	do.	June 15.		
Eavenson & Sons,	Soap,	22	8	4	do.	June 16.		
W. G. Ellis,	Hosiery,	15	135	25	do.	June 16.		
Hensel, Colliday & Co.,	Trimnings,	55	420	25	do.	June 17.		
Stephen Green,	Blank books,	95	15	5	do.	June 17.		
J. M. Applebaum,	Clothing,	50	25	13	do.	June 20.	Erect fire escape, box four shafts, place automatic gates at all elevator ways, designate water closets, and report accidents.	Complied.
H. Feinberg,	Coats and button holes,	50	30	2	do.	June 21.	Erect fire escape, box two shafts, place automatic gates at all elevator ways, designate water closets, and report accidents.	Complied.
Kirchbaum & Co.,	Tailoring,	82	128	12	do.	June 22.	Erect fire escape, also ropes and chains from every other window above second floor, place automatic gates at all elevator ways, safe guard to all windows in elevator shaft, designate water closets, and report accidents.	Complied.
Hub Laundry,	Laundry,	1	11	10	Good.	June 23.	Furnish water closets for females, the same to be properly screened, ventilated and always to be kept clean, designated and separate and apart from those used by males; report all accidents.	Complied.
U. S. Cigar Factory,	Cigars,	75	175	1	do.	June 24.	Erect two or more external fire escapes, also ropes and chains to every other window on all floors above the second; place safe guards in all windows in elevator shaft; provide toilet room and closets, same to be screened, ventilated and designated; report all accidents.	Complied.
Homer Le Bontillier & Co.,	Dry goods,	100	100	24	do.	June 24.	Furnish an external open fire escape, securely affixed to said building.	Complied.
Presbyterian Board of Publication	Books,	40	10	1	do.	June 27.		
Jno Wanamaker,	Dry goods,	2,000	2,300	500	do.	June 27.	One additional outside fire escape and two exits leading to same.	Complied.
Henry Shadewald,	Quilts,	30	20	15	Fair.	June 28.		
Deelmore Manufacturing Co.,	Alpacas,	75	50	23	do.	June 28.		
G. W. Emlen,	Varus,	10	25	4	do.	June 29.		

PHILADELPHIA, PA.—Continued.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.			Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12. 12 to 16.				
Thos. Cares & Sons.	Woolens.	60	121	. . .	Fair.	June 29.		
John B. Stetson.	Hats.	430	470	. . .	Good.	June 30.		
R. J. Thomson.	Clothing.	185	65	. . .	do.	June 30.		
R. J. Holman.	Bibles.	125	75	. . .	do.	July 1.		
Peter Woll & Sons.	Curled hair.	108	17	. . .	Fair.	July 1.		
C. J. Cohen.	Envelopes.	4	21	. . .	do.	July 1.		
Abe Kirelbaum.	Clothing.	410	90	. . .	do.	July 1.		
Sykes Bros.	Carpets.	27	12	. . .	do.	July 2.		
E. Vaughn.	Yarns.	31	60	. . .	do.	July 2.		
H. B. Thomas.	Woolens.	3	12	. . .	do.	July 2.		
Wm. Holmes & Sons.	Tobacco.	18	7	. . .	do.	July 2.		
Allen & Martin.	Shoes.	72	3	. . .	do.	July 5.		
S. E. Baxter.	Shirts.	10	30	. . .	do.	July 5.		
Bloch & Scherwin.	Paper boxes.	40	10	. . .	do.	July 6.		
A. Bernstein.	Dress trimmings.	9	16	. . .	do.	July 6.		
C. N. Carr.	Laundry.	2	18	. . .	do.	July 7.		
Jas. Cotter.	Shoes.	25	50	. . .	do.	July 7.		
Daniels Bros.	Millinery.	5	30	. . .	Good.	July 8.		
Freeman & Ronch.	Shirts.	14	26	. . .	Fair.	July 8.		
John Graf.	Embroideries.	27	13	. . .	Fair.	July 9.		

PHILADELPHIA, PA.—Continued.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.				Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.			Females.				
		Under 12.	12 to 16.	17 to 21.					
Hoopes & Townsend,	Bolts,	560	. . . . .	29	Fair,	Aug. 1.			
Oehrie Bros.,	Trimings,	65	10	12	do.	Aug. 2.			
Roig & Langsdorf,	Cigars,	20	180	23	do.	Aug. 3.			
Thomas Price,	Envelopes,	60	15	6	do.	Aug. 3.			
W. Rutteln,	Book binding,	6	34	. . . . .	do.	Aug. 4.			
Keystone Saw Works,	Saws,	3,675	325	275	Good,	Aug. 4.	Erect six exits to be used in case of fire, . . .	Complied.	
John Wanamaker,	Dry goods,	2,000	2,300	600	Fair,	Aug. 4.			
Sherman & Co.,	Book printing,	11	19	. . . . .	do.	Aug. 5.			
Shoneman & Co.,	Notions,	25	100	30	do.	Aug. 5.			
S. C. Richardson,	Buttons,	10	40	10	do.	Aug. 5.			
Western Union Telegraph Co.,	Telegrams,	600	200	500	Good,	Aug. 6.			
H. Smith,	Paper boxes,	15	45	2	Fair,	Aug. 6.			
Hogg & Metzgar,	Carpets,	78	78	6	do.	Aug. 8.			
Oxford Carpet Mills,	do,	80	70	. . . . .	do.	Aug. 8.			
Homer LeBoutillier & Co.,	Dry goods,	100	100	24	do.	Aug. 8.			
S. J. Dunn,	Cigars,	75	175	23	Good,	Aug. 9.			
A. F. Marston,	Laundry,	2	10	9	Fair,	Aug. 9.			
Sillig & Kaufman,	Buttons,	10	55	9	do.	Aug. 9.			
F. Shoettle,	Paper boxes,	10	150	23	do.	Aug. 10.			

F. Schmidt, David Stern, E. Shullig, Alfred Williams, Webb & Lepore, Webster & Sons, Wineberger & Co., Walford & Co., Williamson & Co., Myerhoff & Rothschild.	Paper boxes, Children's cloaks, Paper boxes, Gloves, Shoes, Cocoa, Lace caps, Books, Umbrellas, Infants cloaks,	2	25	3	do.	Aug. 10.	Aug. 10.	Aug. 10.	Aug. 11.	Aug. 11.	Aug. 11.	Aug. 12.	Aug. 12.	Aug. 12.	Aug. 12.	Complied.
F. Schmidt,	Paper boxes,	2	25	3	do.	Aug. 10.	Aug. 10.	Aug. 10.	Aug. 11.	Aug. 11.	Aug. 11.	Aug. 12.	Aug. 12.	Aug. 12.	Aug. 12.	Place automatic traps or gates to elevator; two or more outside open fire escapes; dressing room for female employees; designate water closet.
David Stern,	Children's cloaks,	15	160	42	Good.	Aug. 10.	Aug. 10.	Aug. 10.	Aug. 11.	Aug. 11.	Aug. 11.	Aug. 12.	Aug. 12.	Aug. 12.	Aug. 12.	
E. Shullig,	Paper boxes,	3	22	8	Fair.	Aug. 10.	Aug. 10.	Aug. 10.	Aug. 11.	Aug. 11.	Aug. 11.	Aug. 12.	Aug. 12.	Aug. 12.	Aug. 12.	
Alfred Williams,	Gloves,	2	27	1	Good.	Aug. 11.	Aug. 11.	Aug. 11.	Aug. 11.	Aug. 11.	Aug. 11.	Aug. 12.	Aug. 12.	Aug. 12.	Aug. 12.	
Webb & Lepore,	Shoes,	15	35	...	Fair.	Aug. 11.	Aug. 11.	Aug. 11.	Aug. 11.	Aug. 11.	Aug. 11.	Aug. 12.	Aug. 12.	Aug. 12.	Aug. 12.	
Webster & Sons,	Cocoa,	20	50	...	do.	Aug. 11.	Aug. 11.	Aug. 11.	Aug. 11.	Aug. 11.	Aug. 11.	Aug. 12.	Aug. 12.	Aug. 12.	Aug. 12.	
Wineberger & Co.,	Lace caps,	4	15	5	Good.	Aug. 12.	Aug. 12.	Aug. 12.	Aug. 12.	Aug. 12.	Aug. 12.	Aug. 12.	Aug. 12.	Aug. 12.	Aug. 12.	
Walford & Co.,	Books,	12	20	...	Fair.	Aug. 12.	Aug. 12.	Aug. 12.	Aug. 12.	Aug. 12.	Aug. 12.	Aug. 12.	Aug. 12.	Aug. 12.	Aug. 12.	
Williamson & Co.,	Umbrellas,	6	8	...	Good.	Aug. 12.	Aug. 12.	Aug. 12.	Aug. 12.	Aug. 12.	Aug. 12.	Aug. 12.	Aug. 12.	Aug. 12.	Aug. 12.	
Myerhoff & Rothschild.	Infants cloaks,	20	180	13	do.	Aug. 12.	Aug. 12.	Aug. 12.	Aug. 12.	Aug. 12.	Aug. 12.	Aug. 12.	Aug. 12.	Aug. 12.	Aug. 12.	
Krichbaum & Co.,	Clothing,	142	128	12	do.	Aug. 13.	Aug. 13.	Aug. 13.	Aug. 13.	Aug. 13.	Aug. 13.	Aug. 13.	Aug. 13.	Aug. 13.	Aug. 13.	
Philip Doerr,	Carpets,	150	30	10	Fair.	Aug. 15.	Aug. 15.	Aug. 15.	Aug. 15.	Aug. 15.	Aug. 15.	Aug. 15.	Aug. 15.	Aug. 15.	Aug. 15.	
Jacob Datz,	Corsets,	5	145	...	Good.	Aug. 15.	Aug. 15.	Aug. 15.	Aug. 15.	Aug. 15.	Aug. 15.	Aug. 15.	Aug. 15.	Aug. 15.	Aug. 15.	
Erd & Docker,	Paper boxes,	25	50	7	Fair.	Aug. 16.	Aug. 16.	Aug. 16.	Aug. 16.	Aug. 16.	Aug. 16.	Aug. 16.	Aug. 16.	Aug. 16.	Aug. 16.	
Elliott & Malory,	Envelopes and cards,	20	15	...	do.	Aug. 16.	Aug. 16.	Aug. 16.	Aug. 16.	Aug. 16.	Aug. 16.	Aug. 16.	Aug. 16.	Aug. 16.	Aug. 16.	
W. H. Desarth,	Paper boxes,	35	30	4	do.	Aug. 16.	Aug. 16.	Aug. 16.	Aug. 16.	Aug. 16.	Aug. 16.	Aug. 16.	Aug. 16.	Aug. 16.	Aug. 16.	
Expert Laundry,	Laundry,	18	18	...	do.	Aug. 17.	Aug. 17.	Aug. 17.	Aug. 17.	Aug. 17.	Aug. 17.	Aug. 17.	Aug. 17.	Aug. 17.	Aug. 17.	
W. G. Ellis,	Hosiery,	165	135	27	do.	Aug. 17.	Aug. 17.	Aug. 17.	Aug. 17.	Aug. 17.	Aug. 17.	Aug. 17.	Aug. 17.	Aug. 17.	Aug. 17.	
S. S. Fretz,	Parasols,	150	150	25	do.	Aug. 18.	Aug. 18.	Aug. 18.	Aug. 18.	Aug. 18.	Aug. 18.	Aug. 18.	Aug. 18.	Aug. 18.	Aug. 18.	
Stanley G. Flagg & Co.,	Iron,	280	...	18	do.	Aug. 18.	Aug. 18.	Aug. 18.	Aug. 18.	Aug. 18.	Aug. 18.	Aug. 18.	Aug. 18.	Aug. 18.	Aug. 18.	
Forrest Laundry,	Laundry,	41	34	1	do.	Aug. 19.	Aug. 19.	Aug. 19.	Aug. 19.	Aug. 19.	Aug. 19.	Aug. 19.	Aug. 19.	Aug. 19.	Aug. 19.	
Folmer, Clogg & Co.,	Parasols,	320	280	30	Good.	Aug. 19.	Aug. 19.	Aug. 19.	Aug. 19.	Aug. 19.	Aug. 19.	Aug. 19.	Aug. 19.	Aug. 19.	Aug. 19.	
A. Gentzeth & Co.,	Paper boxes,	25	50	...	Fair.	Aug. 19.	Aug. 19.	Aug. 19.	Aug. 19.	Aug. 19.	Aug. 19.	Aug. 19.	Aug. 19.	Aug. 19.	Aug. 19.	
W. H. Horstman Sons,	Trimings,	250	350	23	do.	Aug. 20.	Aug. 20.	Aug. 20.	Aug. 20.	Aug. 20.	Aug. 20.	Aug. 20.	Aug. 20.	Aug. 20.	Aug. 20.	
W. D. Hutton,	Shirts,	5	25	...	do.	Aug. 20.	Aug. 20.	Aug. 20.	Aug. 20.	Aug. 20.	Aug. 20.	Aug. 20.	Aug. 20.	Aug. 20.	Aug. 20.	
J. W. Hallahan,	Shoes,	3	17	4	do.	Aug. 20.	Aug. 20.	Aug. 20.	Aug. 20.	Aug. 20.	Aug. 20.	Aug. 20.	Aug. 20.	Aug. 20.	Aug. 20.	
John Gray's Sons,	Carpets,	50	175	30	do.	Aug. 20.	Aug. 20.	Aug. 20.	Aug. 20.	Aug. 20.	Aug. 20.	Aug. 20.	Aug. 20.	Aug. 20.	Aug. 20.	
E. C. Howlett & Sons,	Paper bags,	19	16	...	Fair.	Aug. 22.	Aug. 22.	Aug. 22.	Aug. 22.	Aug. 22.	Aug. 22.	Aug. 22.	Aug. 22.	Aug. 22.	Aug. 22.	

PHILADELPHIA, PA.—Continued.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.			Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12.	12 to 16.			
Heideberger, Frank & Co., . . .	Fancy goods,	25	75	..	4	Aug. 22.		
Harris & Henderson,	Shoes,	170	5	..	5	Aug. 22.		
J. M. Hensell,	Envelopes,	19	16	..	4	Aug. 22.		
C. W. Hill,	Shoes,	50	25	..	..	Aug. 23.		
Hageman & Bachelor,	Gents' furnishing goods, . . .	30	20	..	..	Aug. 23.		
Merz & Hagendon,	Shirts,	200	300	..	21	Aug. 23.		
A. J. Irwin,	Cottons and woollens,	22	28	..	12	Aug. 24.		
David Henley,	Artificial flowers,	35	165	..	45	Aug. 24.		
F. Hassler,	Parasols,	5	15	..	1	Aug. 24.		
John Mundell & Co.,	Shoes,	500	350	..	150	Aug. 25.		
Lamarille & Co.,	Notions,	2	10	..	4	Aug. 25.		
Knight & Co.,	Shirts,	8	27	..	..	Aug. 25.		
John Orne,	Watch cases,	31	4	..	6	Aug. 26.		
Oliver & Co.,	Shoes,	25	15	..	..	Aug. 26.		
Nonpareil Laundry,	Laundry,	10	25	..	3	Aug. 26.		
Novely Straw Works,	Straw goods,	20	10	..	8	Aug. 26.		
Philadelphia Local Telegraph Co.,	Local telegrams,	18	17	..	3	Aug. 23.		
Thomas A. Pearce,	Hosiery,	100	300	..	35	Aug. 29.		
Porter & Diekey,	Cotton goods,	100	100	..	20	Aug. 30.		
Porter & Coates,	Books,	25	15	..	8	Aug. 30.		

Ol. K. Reed,	Laundry,	20	38	..	10	Fair,	Aug. 30.
Shoneman Bros.,	Notions,	25	100	..	30	do.	Aug. 31.
Rosenhelm Bros.,	Straw goods,	20	40	..	1	do.	Aug. 31.
Shelp & Vandyke,	Cigar boxes,	52	28	..	7	do.	Sept. 1.
E. Stern,	Cards,	10	30	..	..	do.	Sept. 1.
Henry Zauner,	Children's caps,	1	79	..	21	do.	Sept. 2.
E. Thaleg,	Paper boxes,	3	22	..	9	do.	Sept. 2.
Kaufman Bros.,	Trimmings,	100	300	..	24	do.	Sept. 13.
M. W. Lipper & Co.,	do.	100	400	..	27	Good,	Sept. 13.
Hensel, Colladay & Co.,	do.	20	40	..	75	do.	Sept. 14.
Hensel, Colladay & Co.,	do.	100	400	..	25	do.	Sept. 14.
E. H. Godshalk & Co.,	do.	200	400	..	12	do.	Sept. 14.
Lazarus, Schwartz & Lipper,	Buttons,	300	200	..	13	do.	Sept. 27.
Ziegler Bros.,	Shoes,	300	200	..	80	do.	Sept. 27.
Smith & Peters,	Candy,	16	8	..	7	Fair.	Oct. 3.
John Stiffen,	Shoes,	13	12	..	4	do.	Oct. 4.
Economy Shirt Company,	Shirts,	5	75	..	9	do.	Oct. 5.
Verline Bros.,	Cigars,	85	15	..	5	do.	Oct. 5.
Wells Frank & Co.,	Infants' wear,	40	50	..	21	do.	Oct. 6.
R. Wilde & Son,	Yarns,	50	14	..	9	do.	Oct. 6.
W. R. Warren & Co.,	Chemists,	8	12	..	5	do.	Oct. 7.
A. C. Yates & Co.,	Clothing,	70	5	..	15	do.	Oct. 7.
Jos. Adamson,	Braids,	25	150	..	21	do.	Oct. 10.
F. H. Belcher,	Printing,	10	80	..	13	do.	Oct. 10.
Brown & Bailey,	Paper boxes,	2	50	..	29	do.	Oct. 11.
Belmont Knitting Mills,	Skirts,	15	20	..	5	do.	Oct. 11.
Thos. Carrick,	Crackers,	55	1	..	12	do.	Oct. 12.

Employment of children without certificates; minors not to work more than 60 hours in any week; report accidents.

Complied.

Comply with sections 1 and 2,

Complied.

Comply with sections 1, 2 and 9,

Complied.

Comply with sections 1, 2 and 9; clean all stairways, walls, etc., and remove all obstructions from the same at once.

Complied.

Comply with sections 1 and 9,

Complied.

Comply with sections 1, 2 and 9,

Complied.

Comply with sections 2 and 9, and box 2 shafts

Complied.

Comply with sections 1, 2, 7, 9 and 10.

PHILADELPHIA, PA.—Continued.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.			Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12. 12 to 16.				
Cook Bros.,	Hosiery,	25	50	..	29	Fair, Oct. 12.		
Continental Manufacturing Co., .	Muclage,	8	7	..	5	do. Oct. 13.		
Arthur Frick,	Perfumery,	12	15	..	..	Good, Oct. 13.		
R. Gerson,	Millinery,	50	100	..	21	Fair, Oct. 13.		
M. S. Hagen,	Shoes,	33	7	..	3	do. Oct. 14.		
C. C. Hancock,	Neckwear,	25	150	..	13	Good, Oct. 14.		
J. C. Graham,	Trimings,	90	85	..	29	do. Oct. 14.		
Keebler Biscuit Company,	Crackers,	40	40	..	10	Fair, Oct. 17.		
Keystone Watch Company,	Watch cases,	975	325	..	136	do. Oct. 17.		
Homer, Le Bottiller & Co., . . .	Dry goods,	125	75	..	34	do. Oct. 19.		
Ketterlinus & Co.,	Printing,	122	28	..	36	do. Oct. 19.		
Keystone Saw Works,	Saws and files,	3,675	325	..	275	Good, Oct. 20.		
De Young & Hoffman,	Neckwear,	15	35	..	..	Fair, Oct. 20.		
Myerhoff & Rothschild,	Infants' goods,	20	180	..	66	Good, Oct. 21.		
Wm. Woods & Co.,	Woolen Mill,	615	635	..	125	Fair, Oct. 21.		
Continental Knitting Mills, . . .	Knit goods,	30	80	..	52	do. Oct. 22.		
Krehbaum & Co.,	Clothing,	172	128	..	12	Good, Oct. 22.		
R. J. Allen,	Chlnaware,	65	15	..	3	do. Oct. 24.		
H. B. Ashmead,	Printing,	33	12	..	5	Fair, Oct. 24.		
Blum Bros.,	Clonks,	100	50	..	..	do. Oct. 25.		

Lewis T. Bailey,	do.	45	30	. . . . .	do.	Oct. 25.
E. R. Brille,	Carpets,	35	15	. . . . .	do.	Oct. 26.
J. Birge,	Artificial flowers,	10	115	. . . . .	Good,	Oct. 26.
D. W. Custer,	Millinery,	10	40	. . . . .	do.	Oct. 27.
Chambers & Co.,	Parasols,	5	20	. . . . .	do.	Oct. 27.
Croton, Wood & Co.,	Shoes,	80	40	. . . . .	Fair,	Oct. 28.
Hirsh Bros.,	Umbrellas,	200	350	. . . . .	do.	Oct. 29.
Eastman & Bro.,	Perfumery,	18	27	. . . . .	do.	Oct. 29.
A. B. Cox,	Shoes,	50	20	. . . . .	do.	Oct. 29.
Lyons & Loeb,	Paper boxes	78	12	. . . . .	do.	Nov. 1.
Hayes Shoe Company,	Shoes,	150	50	. . . . .	do.	Nov. 1.
G. Sassman,	Hosiery,	10	110	. . . . .	do.	Nov. 2.
J. B. McConnell & Co.,	Cotton yarns,	15	30	. . . . .	do.	Nov. 2.
Taylor & Carr,	Shoes,	55	15	. . . . .	do.	Nov. 3.
Shedaker & Co.,	Shirts,	5	75	. . . . .	do.	Nov. 3.
H. Heppe,	Paper boxes,	1	19	. . . . .	do.	Nov. 4.
Henry Miller,	Yarns,	11	14	. . . . .	do.	Nov. 4.
Dr. Jayne & Son,	Laboratory,	85	40	. . . . .	do.	Nov. 4.
Smith Type Foundry,	Type,	297	3	. . . . .	do.	Nov. 4.
S. F. Whitman & Sons,	Chocolates,	70	50	. . . . .	do.	Nov. 5.
Burk & McFeildge,	Printing,	90	4	. . . . .	do.	Nov. 5.
Evenson & Co.,	Soap,	32	8	. . . . .	do.	Nov. 5.
J. M. Applebaum,	Clothing,	50	30	. . . . .	Good,	Nov. 7.
H. Feinberg,	Button holes,	50	25	. . . . .	Fair,	Nov. 7.
Whitall, Tatum & Co.,	Glass,	76	9	. . . . .	Good,	Nov. 8.
Star Carpet Mills,	Carpets,	90	90	. . . . .	Fair,	Nov. 8.
Columbia Carpet Mills,	do.	33	15	. . . . .	do.	Nov. 9.
Thomas Devlin & Sons,	do.	70	50	. . . . .	do.	Nov. 9.
O'Neill Bros,	Woolens,	18	10	. . . . .	do.	Nov. 10.

Designate water closets.

PHILADELPHIA, PA.—Continued.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.				Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12.	12 to 16.				
Putnam Carpet Company,	Carpets,	75	75	..	60	Fair,	Nov. 10.		
William Hunter,	Yarns and woolen goods, . .	450	450	..	84	do.	Nov. 10.		
Brown Bros.,	Hosiery,	50	250	..	105	do.	Nov. 10.		
J. H. Klauber,	Quilts,	10	125	..	14	do.	Nov. 11.		
Thomas Dolan,	Woolens,	250	100	..	51	do.	Nov. 11.		
Thomas A. Pearce,	Hosiery,	100	300	..	35	do.	Nov. 11.		
Henry Shadewald,	Quilts,	30	20	..	8	do.	Nov. 11.		
John B. Stetson,	Hats,	430	470	..	50	do.	Nov. 12.		
C. R. Jones,	Yarns,	10	25	..	4	do.	Nov. 12.		
Thomas Cares,	Woolens,	160	121	..	..	do.	Nov. 12.		
Hensel, Colladay Company, . . .	Trimnings,	100	400	..	25	do.	Nov. 14.		
Hensel, Colladay Branch,	do.	120	40	..	15	do.	Nov. 14.		
Kaufman Bros.,	do.	100	300	..	24	do.	Nov. 15.		
M. W. Lipper,	do.	100	400	..	25	do.	Nov. 16.		
Lazarus, Schwartz & Lipper, . . .	do.	325	200	..	13	do.	Nov. 17.		
Ziegler Bros.,	Shoes,	200	300	..	32	do.	Nov. 18.		
E. H. Godshalk,	Trimnings,	236	400	..	12	do.	Nov. 18.		

Joel Thomas,	Printing,	2	18	.	5	do.	Nov. 21.
Marcus Eisenberg,	Neckwear,	2	23	.	6	do.	Nov. 21.
B. F. Gallagher,	Patent medicines,	13	25	.	8	do.	Nov. 21.
Frederick Bros.,	Perfumery,	4	16	.	4	do.	Nov. 25.
S. S. White,	Dental Manufacturing Co.,	600	225	.	. . . .	do.	Nov. 26.

ACCIDENT REPORTS OF M. N. BAKER.—THIRD DISTRICT. PITTSBURG, PA.

Date of accident.	PERSONS INJURED.	Age.	Establishment in which accident occurred.	Location.	Machine, etc., on which accident occurred.	Particulars and extent of injury.
1892.						
Dec. 4.	John McFarland. . .	49	Harbison & Walker.	Pittsburg.		Leg broken caused by slipping of pulley wheel.
Dec. 5.	Joe Myers.		Oliver Iron and Steel Company. .	do.		Lost three fingers while working at the rolls.
Dec. 10.	Wm. Fields.		Carnegie, Phipps & Co.,	Munhall.		Pusher broke at top of ingot and steel blew out on him, burning his back.
Dec. 16.	B. Bowen.	33	do.	do.		Fell from shear housing; broke two of his ribs.
Dec. 17.	Herman Lombeck. .	26	Pittsburg Forge and Iron Co., . .	Allegheny.		Toes on left foot badly bruised, caused by breaking of chain carrying porter bar on truck.
Dec. 18.	John Vollitt.	50	Carnegie, Phipps & Co.,	Munhall.		Broken leg and badly shaken up by falling into furnace pit.
Dec. 19.	Jos. Connors. . . .	24	do.	do.		Both legs burned by the explosion of steel ingot.
Dec. 22.	Edward Alishouse. .	30	do.	do.		Beam fell from iron buggy and struck him on leg, wounding it.
Dec. 26.	Jacob Werner. . . .		Carnegie Bros. & Co.,	Bessemer.		Fell from wall into clinder pit, resulting in his death.
Jan. 7.	Barbara Hoffman. .	16	Barnes Bros. & Co.,	Pittsburg.	Elevator.	Put foot outside of elevator; toe cut off.
Jan. 9.	Richard Shatton. . .	35	Carnegie, Phipps & Co.,	Munhall.		Struck by falling timber; cut on head.
Jan. 14.	Antony Lorenski. . .		Oliver Iron and Steel Company. .	Pittsburg.		Upset barrow of hot clinder; foot burned.
Jan. 15.	Frank McGraw. . .	21	Canregie, Philipps & Co.,	do.		Contusion of hand while coupling cars

Jan. 18,	Edward Rhodes, . . .	30	do.	do.	do.	do.	do.	do.	Foot caught in moving machinery; contusion of foot.
Jan. 21,	Stephen Paltas, . .	38	do.	do.	do.	Munhall,	do.	do.	Ingot casting fell on him; both legs and rib broken.
Jan. 24,	Elias Waltz, . . . .	...	Cambria Iron Co.,	do.	do.	Johnstown,	do.	Ore pile,	Leg cut by lump of ore falling on it.
Feb. 2,	Robert Miller, . . .	29	do.	do.	do.	do.	do.	Cog wheels conveying rollers,	Fell in cog wheels, left leg crushed.
Feb. 2,	Alfred Lawry, . . .	20	Carnegie, Phipps & Co.,	do.	do.	Munhall,	do.	Shaft driving rolls,	Clothing caught in roller shaft; leg broken and one arm bruised.
Feb. 2,	Anton Wolchansky, .	40	Cambria Iron Co.,	do.	do.	Johnstown,	do.	On railroad in mill yard,	Caught between ears; instant death.
Feb. 3,	Findley Smith, . . .	...	Johnson Company,	do.	do.	do.	do.	do.	Struck on leg by a piece of iron.
Feb. 6,	Frank Lalbier, . . .	17	Carnegie, Phipps & Co.,	do.	do.	Munhall,	do.	Nut tapping machine.	Four fingers mashed; he caught hold of a spur wheel and reached up till his hand passed through gears.
Feb. 8,	Jos. Baekus,	20	do.	do.	do.	Pittsburg,	do.	do.	Pile of iron fell on his leg, crushing it.
Feb. 9,	W. J. Lehman, . . .	31	Park Bros. & Co.,	do.	do.	do.	do.	do.	Wall of No. 8 crucible steel melting furnace, where he was at work, fell on him; lacerated wound under the chin.
Feb. 9,	L. Walker,	38	Carnegie, Phipps & Co.,	do.	do.	do.	do.	do.	In passing old plate mill with a buggy a chain caught buggy and the handle struck him, throwing him down, he falling against another buggy, broken rib.
Feb. 9,	John Bender,	19	Cambria Iron Co.,	do.	do.	Johnstown,	do.	Rolls,	Hot bar coming through rolls caught him; severe burn of groin.
Feb. 10,	Isaac Forney,	40	Carnegie, Phipps & Co.,	do.	do.	Munhall,	do.	Planer,	Forefinger and end of thumb cut off; working on planer at the time.
Feb. 10,	Fred. Krell, . . . . .	...	Johnson Company,	do.	do.	Johnstown,	do.	do.	Hand cut by helping to unload rails.
Feb. 11,	Jas. Williams,	35	Johnson Company,	do.	do.	do.	do.	do.	Struck by key from hammer; lacerated wound of cheek.
Feb. 13,	John D. Jones, . . .	50	Cambria Iron Company,	do.	do.	do.	do.	Macinery Hall,	Casting slipped and caught him between platform and car; both legs broken.
Feb. 14,	James Robinson, . . .	...	do.	do.	do.	do.	do.	Casting house, hot furnace,	Toes of left foot mashed, caused by dropping a pig of metal on them.
Feb. 16,	George H. Ling, . . .	23	Johnson Company,	do.	do.	do.	do.	Stralgbttening press,	Second finger of right hand mashed by fastening nut on plunger while press was in motion.

ACCIDENTS—Continued.

Date of accident.	PERSONS INJURED.	Age.	Establishment in which accident occurred.	Location.	Machine, etc., on which accident occurred.	Particulars and extent of injury.
Feb. 17,	Lewis Mahoney, . .	17	Carnegie, Phipps & Co.,	Munhall,	Locomotive,	Was on the foot-board of engine and in stepping across slipped and fell; hurt internally.
Feb. 18,	George Rausch, . .	22	Cambria Iron Company,	Johnstown,	Engine,	Hand mashed by being caught between brasses and the pin on engine.
Feb. 19,	B. B. Pollock, . .	45	Johnson Company,	do. . . . .	. . . . .	Right eye injured; piece of steel flew in it.
Feb. 21,	William H. Jones, .	17	Carnegie, Phipps & Co.,	Munhall, . . . . .	. . . . .	Killed while riding on engine.
Feb. 22,	Thomas Burdick, . .	38	Cambria Iron Company,	Johnstown,	Coke hoist,	Sledge slipped from the hands of a fellow-workman while sledging on a plate; arm broken.
Feb. 23,	Patrick Ferry, . .	40	Carnegie, Phipps & Co.,	Pittsburg,	Ash hoist,	Caught in machinery; lost little finger.
Feb. 25,	William Fields, . .	22	Park Bros. & Co.,	do. . . . .	. . . . .	Carelessness; foot crushed.
Feb. 29,	Albert Bardwell, . .	22	Erle City Iron Works,	Erle, . . . . .	. . . . .	Crank shaft slipping through worsted crane, crushing his ankle.
Feb. 29,	W. B. McCrane, . .	25	Cambria Iron Company,	Johnstown,	Boiler,	Struck by a piece of steel; eye injured.
Mar. 1,	George Engelhardt, .	35	A. J. Heinz Company,	Allegheny, . . . . .	. . . . .	Severe gash in leg, caused by using pocket-knife, which was not required at his work.
Mar. 1,	G. W. Nipps,	35	Cambria Iron Company,	Johnstown, . . . . .	. . . . .	Pig of metal slipped off car and caught his hand, cutting it very badly.
Mar. 3,	John Brotello, . . .	. . .	Carnegie Bros. & Co.,	Braddock, . . . . .	. . . . .	Was killed by ore falling on him.
Mar. 4,	Joseph Dunko, . . .	. . .	do.	do. . . . .	. . . . .	Killed by ore falling on him.
Mar. 4,	M. Menser,	28	Johnson Company,	Johnstown,	Locomotive,	Squeezed in bowels while coupling cars to engine; extent of injury not known.

Mar. 7,	Jacob Snyder,	Oliver Iron and Steel Company,	Pittsburg, . . . . .	. . . . .	Thrown against crane; loss of two fingers.
Mar. 7,	Henry Allison,	Cambria Iron Company,	Johnstown,	Rolls,	A bar of iron slipped under rolls cutting two toes from right foot.
Mar. 7,	Daniel McGowan,	do.	do. . . . .	. . . . .	Made a misstep and fell about eighteen feet; concussion of brain.
Mar. 8,	William Downey,	do.	do.	On railroad in mill yard,	While coupling cars received injury to skull.
Mar. 12,	Fred. Zinner,	Johnson Company,	do. . . . .	. . . . .	Was helping to load truck with rails; rail fell on his leg badly bruising it.
Mar. 18,	Mike Kotch,	Carnegie Bros. & Co.	Bessemer. . . . .	. . . . .	Squeezed between cars and falling off tender pit; skull fractured and three ribs broken.
Mar. 17,	Steve Yarnick,	Carnegie Bros. & Co.,	Bessemer, . . . . .	. . . . .	Squeezed between cars and falling under pit; skull fractured and three ribs broken.
Mar. 26,	Arthur McGusk,	Carnegie, Phipps & Co.,	Munhall, . . . . .	. . . . .	Burned on face and body.
Mar. 26,	Albert Williams,	do.	do. . . . .	. . . . .	Head and arms badly burned.
Mar. 26,	Thomas Harding,	do.	do. . . . .	. . . . .	Face, arms and hands badly burned.
Mar. 26,	James Baird,	do.	do. . . . .	. . . . .	Hands badly burned.
Mar. 26,	Frank Able,	do.	do. . . . .	. . . . .	Badly burned about legs.
Mar. 26,	Peter Woods,	do.	do. . . . .	. . . . .	Dangerously burned about head, face and body.
Mar. 26,	John Shields,	do.	do. . . . .	. . . . .	Dangerously burned about head, face and body.
Mar. 26,	Andy Stofield,	do.	do. . . . .	. . . . .	Seriously burned; resulting in his death.
Mar. 29,	William Greather,	Cambria Iron Company,	Johnstown,	Metal buggy,	Fell on buggy of hot metal; legs and body badly burned.
Mar. 30,	Jos. Watsic,	Carnegie, Phipps & Co.,	Beaver Falls,	Large scrap shears,	Fell backward and by so doing threw his hand in the shears, cutting it badly.
April 1,	Edward Fessler,	Johnson Company,	Johnstown,	Jack engine,	Hurt his foot on engine.
April 1,	Nelson M. Miller,	do.	do. . . . .	. . . . .	Hanger for countershaft broke and in falling struck him on the leg, severely cutting it.

ACCIDENTS—Continued.

Date of accident.	PERSON INJURED.	Age.	Establishment in which accident occurred.	Location.	Machine, etc., on which accident occurred.	Particulars and extent of injury.
April 2.	Andy Conner. . . .	45	Carnegie, Phipps & Co.,	Munhall, . . . . .	. . . . .	While unloading steel in the mill yard the guy lines broke, and let the crane fall, the jib fell across his stomach and right hip, injuring stomach and hip-joint.
April 3.	John Peudry,	34	Cambria Iron Company,	Johnstown,	Electric light,	Touched electric light to light a torch; shock killed him.
April 7.	Georgo Myroshe, . .	30	Carnegie, Phipps & Co.,	Munhall. . . . .	. . . . .	Was unloading scrap, and his hand caught under scrap; fingers cut off.
April 13.	Chas. Yalla,	32	Erie City Iron Works,	Erie, . . . . .	. . . . .	Cut across right eye by a piece of steel.
April 18.	Thomas Parfitt, . .	26	Cambria Iron Company,	Johnstown,	Car,	Fell from a car and broke his leg.
April 21.	Emily Hill,	27	Western File Company,	Beaver Falls,	File cutting machine,	Was caught in machine; thumb of right hand badly squeezed.
April 24.	Russell Bowen, . . .	50	Cambria Iron Company,	Johnstown,	Engine,	Carelessly put his hand between crank and bed plate of engine; thumb and finger of right hand cut off.
April 30.	John Rich, . . . .	. . .	Oliver Iron and Steel Company, .	Pittsburg, . . . . .	. . . . .	Foot burned by a piece of hot iron; by his own inadvertence.
May 1.	Thomas Nicholson, .	25	Carnegie, Phipps & Co.,	do. . . . .	. . . . .	Contusion of head by falling against an iron bar.
May 1.	William Smith, . .	30	do.	do. . . . .	. . . . .	Bruised on leg by being struck by head of hammer.
May 2.	L. E. Murphy, . . .	32	do.	do.	Axle hammer,	Cut on arm by a piece of iron.
May 2.	Joseph Arrban, . .	30	Cambria Iron Company,	Johnstown,	Railroad track,	Leg crushed by stepping on track in front of moving car.
May 4.	Thomas Hambry, . .	. . .	Oliver Iron and Steel Company, .	Pittsburg,	Steam hammer,	Handle of hammer flew up and broke his jaw.

May	4.	John Blum,	do.	do.	do.	do.	do.	do.	Was helping to charge furnace, pile fell on him; thumb cut and injured internally.
May	8.	William Morrison,	do.	do.	do.	do.	do.	do.	Left eye and side of face burned by explosion of gas.
May	9.	William Sillman, 22	Cambria Iron Company,	do.	do.	Johnstown,	do.	Planer,	Working at Buss planer, piece turned and caught his hand, cutting off thumb and finger of left hand.
May	10.	Edw. F. Follansbee, 22	Carnegie, Phipps & Co.,	do.	do.	Munhall,	do.	do.	He attempted to pass in front of straightening rolls while a beam was going through and was crushed between the end of the beam and the table, resulting fatally.
May	10.	Harry McHenry, 34	John Dunlap & Co.,	do.	do.	Pittsburg,	do.	Drop press,	Loss of three fingers caused by his removing the safety catch to hammer, which came down twice.
May	11.	Joseph Brown,	Oliver Iron and Steel Company,	do.	do.	do.	do.	Steam engine,	Bruised and leg cut on engine.
May	18.	Frank Kush,	do.	do.	do.	do.	do.	Plate shear,	Was assisting to shear plates and his hand was caught between the plate and the moving head of the shear; hand lacerated.
May	20.	Joseph Sopp,	Phillips, Nimick & Co.,	do.	do.	do.	do.	Hand crane,	Struck by handle of crane; scalp wound.
May	24.	Thomas Moran, 43	Park Bros. & Co.,	do.	do.	do.	do.	do.	Breaking of timber while at work; sprain of both ankle joints.
May	24.	Daniel Hughes, 20	Carnegie, Phipps & Co.,	do.	do.	Munhall,	do.	do.	Foot caught between rail and switch; leg fractured.
May	25.	J. Bradley, 27	Johnson Company,	do.	do.	Johnstown,	do.	do.	While helping to move a heavy rail from stock bed one finger was badly bruised.
May	26.	Chas. Hanchid, 35	Carnegie, Phipps & Co.,	do.	do.	Pittsburg,	do.	Shafting,	Was caught in belt, resulting in death.
May	27.	Joe Romish, 27	Oliver Iron and Steel Company,	do.	do.	do.	do.	do.	Scalp cut while at work over head; dropped a nut, which, glancing, struck him.
May	28.	Chas. Delaney,	Marvin Brannen,	do.	do.	do.	do.	Reversible brakes,	Severe contusion of right elbow; carelessness while cleaning machinery.
May	28.	K. Harding, 18	Cambria Iron Company,	do.	do.	Johnstown,	do.	Track (railroad),	Ran over by cars and was killed.
June	2.	Daniel Kelleber, 24	Carnegie, Phipps & Co.,	do.	do.	Pittsburg,	do.	Traveling crane,	Left foot and leg crushed; run over by traveling crane.

ACCIDENTS -- Continued.

Date of acci-	PERSONS INJURED.	Age.	Establishment in which accident occurred.	Location.	Machine, etc., on which accident occurred.	Particulars and extent of injury.
June 2,	Cyrus Noon,	15	Cambria Iron Company,	Johnstown, . . . . .	.....	Was struck by a fellow workman falling from roof; badly bruised and severe shock.
June 2,	Edward McClosky, . .	21	do.	do. . . . .	.....	Fell off casting house; concussion of brain.
June 3,	Peter Mills,	28	Oliver Iron and Steel Company, .	Pittsburg,	Lifting crane,	Struck by handle of crane; head cut and back injured.
June 6,	May Crown,	25	John Dunlap & Co.,	do.	Gearing of cutting press, . .	Caught in gearing; arm fractured.
June 6,	John L. Clites,	26	Johnson Company,	Johnstown, . . . . .	.....	Left foot and ankle badly bruised by a plank falling on it.
June 8,	Morgan Powell, . . .	62	do.	do. . . . .	.....	A piece of iron struck him in the eye; loss of eye.
June 8,	A. Krauser, . . . . .	...	do.	do. . . . .	.....	Carelessness; left foot bruised.
June 10,	W. K. Brown,	30	Cambria Iron Company,	do.	Lumber hoist,	Arm broken and rib dislocated by fall of lumber.
June 13,	Herman Peifer, . . .	32	do.	do.	Elevator,	Fell from elevator and broke ankle bone.
June 14,	Wm. McKinley, . . .	19	Erie City Iron Works,	Erie, . . . . .	.....	Pulley tipped over and crushed his foot.
June 15,	Wm. Stern,	24	Cambria Iron Company,	Johnstown,	Slotter bar table,	Hand caught between bar and table, mashing it.
June 18,	M. Kowattich, . . . .	...	Carnegie Bros. & Co.,	Bessemer, . . . . .	.....	Leg fractured by getting it caught between pinch bar and rail while in the act of barring cars on trestle.
June 19,	M. A. Gray,	24	Johnson Company,	Johnstown, . . . . .	.....	Arm badly burned by pouring benzine on wood in fire box.
June 21,	Elmer Artman,	30	Carnegie, Philipps & Co.,	Munhall, . . . . .	.....	Jaw bone fractured; caused by heavy chain breaking in lifting a die and a piece struck him on the jaw.

June 23,	John Riegold,	23	Cambria Iron Company,	Johnstown,	While carrying pig of iron he slipped and fell, iron falling on his hand, crushing two fingers.
June 23,	John Rothenofen,		Oliver Iron and Steel Company,	Pittsburg,	While lifting an ingot on truck it slipped and fell on him, breaking his leg.
June 25,	Pat McDonough,	30	Phillips, Nimick & Co.,	do.	Bloom of iron fell on his toe and mashed it.
June 28,	Jacob Popranpki,		Oliver Iron and Steel Company,	do.	Crushed about the hips by coal tub in boat in which he was shovelling coal, which swung against him and crushed him against side of boat.
June 30,	Daniel C. Cursnor,	35	Morrison & Cass,	Tyrone,	A piece of hot steel struck him on the wrist, cutting it.
July 2,	Arthur Koontz,	16	Johnson Company,	Johnstown,	Both arms badly sprained; the left one being knocked out of place at wrist, by falling from overhead crane.
July 6,	John White,	40	Bialr Iron and Coal Company,	Holldaysburg,	Caught in clinder hook; two fingers of left hand mashed.
July 7,	Phillip Barr,	29	Pittsburg Forge and Iron Co.,	Allegheny,	Piece of machinery fell on him; badly fractured ankle.
July 8,	Edward Shultz,	33	Erle City Iron Works,	Erle,	While starting to run with ladle of hot iron he fell; burned on one leg.
July 17,	J. H. Marsh,	58	Cambria Iron Company,	Johnstown,	Badly burned back, arm and neck; caused by iron breaking in iron notch.
July 19,	Theo. Williams,	42	Pittsburg Forge and Iron Co.,	Allegheny,	Fell from top of crane; leg broken below the knee.
July 26,	Geo. Hoffman,	28	Johnson Company,	Johnstown,	Left heel caught by broken roll, lacerating foot, necessitating amputation.
Aug. 4,	William Weed,	62	Oliver Iron and Steel Company,	Pittsburg,	Hand lacerated, and injured internally; by the guard that protects the pinions.
Aug. 17,	Arthur E. Cooper,	22	Carnegie Steel Company,	Munhall,	Leg blown off; by gas accumulating in blast pipe and exploding.
Aug. 17,	Edward Rankin,	25	Erle City Iron Works,	Erle,	Lost left eye; by chain of hoist striking him in the eye.
Aug. 20	Wm. Kote,	60	Cambria Iron Company,	Johnstown,	Ran over by cart; leg broken.

ACCIDENTS—Continued.

Date of accident.	PERSONS INJURED.	Age.	Establishment in which accident occurred.	Location.	Machine, etc., on which accident occurred.	Particulars and extent of injury.
Aug. 22,	Edward Chadwick, . . .	20	Pittsburg Forge and Iron Co. . .	Allegheny,	Steam hammer,	Struck on breast by tongs while handling forging hammer.
Aug. 22,	Patrick Dougherty, . . .	..	Carnegie Steel Company.	Bessemer, . . . . .	.. . . .	Right leg broken by being run into by locomotive and cars.
Aug. 23,	John Welst,	35	Erie City Iron Works,	Erie, . . . . .	.. . . .	Hurt one foot; by casting he was working on falling on it.
Aug. 24,	Chas. Earnest, . . . . .	..	Carnegie Steel Company,	Bessemer,	Belting on planer,	Breaking of planer belt; extent of injury not known.
Aug. 27,	John Marshall,	27	Phillips, Ninnick & Co.,	Pittsburg, . . . . .	.. . . .	Leg bruised by iron falling on it.
Aug. 27,	Henry Mohle,	42	Cambria Iron Company,	Johnstown,	Blast furnace,	Badly burned, causing his death; hot coke and ore blew out of furnace on him.
Aug. 31,	Mr. McDonough,	25	Phillips, Ninnick & Co.,	Pittsburg, . . . . .	.. . . .	Collar bone broken; by iron buggy slipping from under heated pile and being thrown down, allighting on his shoulder.
Aug. 31,	Jacob Alley, . . . . .	..	Oliver Iron and Steel Company, . .	do. . . . .	.. . . .	Foot crushed by a piece of iron.
Sept. 3,	Jos. Verbecke, . . . . .	..	do.	do. . . . .	.. . . .	He was cleaning blow chlder from the roof when a portion of the roofing gave way and he fell through to the ground; hurt severely.
Sept. 6,	John Cooney,	65	Erie City Iron Works,	Erie, . . . . .	.. . . .	Was struck by flying iron from cupola; burned on arm and shoulder.
Sept. 10,	Mike Krall,	35	Carnegie Steel Works,	Pittsburg,	Helve hammer,	Caught under hammer; three fingers mashed.
Sept. 10,	Mike Stanichoo, . . . . .	..	Carnegie Steel Company,	Bessemer, . . . . .	.. . . .	Internally injured by getting squeezed between two cars on stock house trestle.

Sept. 11.	James Curley, . . .	30	Cambria Iron Company,	Johnstown,	Cupola,	Rope broke, causing him to fall to bottom; concussion of brain.
Sept. 12.	Frank Fisher, . . .	40	Carnegie Steel Company,	Pittsburg, . . . . .	. . . . .	Steel bloom fell from pile at which he was working; broke knee cap, ankle and thigh.
Sept. 12.	Wm. Edgell,	34	do. do.	do. . . . .	. . . . .	Fell from ladder; bruised leg and burned arm.
Sept. 13.	Michael Sander, . .	49	Cambria Iron Company,	Johnstown,	Trestle,	Fell from plank walk on trestle to bottom of an empty bin, resulting in his death.
Sept. 13.	Joseph Foster, . . .	36	Oliver Iron and Steel Company,	Pittsburg, . . . . .	. . . . .	Flesh burned by a flash from the wells.
Sept. 14.	Andy Leposkey, . .	25	Cambria Iron Company,	Johnstown, . . . . .	. . . . .	Foot and ankle crushed, caused by a small coal car running over it.
Sept. 17.	S. Barthemus, . . .	37	Erle City Iron Works,	Erie, . . . . .	. . . . .	Eye burnt by a piece of hot slag.
Sept. 26.	Frank Lubeskey, . .	25	Phillips, Ninnick & Co.,	Pittsburg, . . . . .	. . . . .	Cut across back of hand; carelessness.
Sept. 29.	Andy Succo, . . . . .	. . .	Carnegie Steel Co.,	Bessemer, . . . . .	. . . . .	Seriously burned about face and body, by blowing up of furnace.
Sept. 30.	Henry Rube,	21	Erle City Iron Works,	Erle, . . . . .	. . . . .	Foot badly crushed by boiler head falling on it.
Oct. 1.	M. Davis,	40	Carnegie Steel Company,	Munhall, . . . . .	. . . . .	Right leg fractured, by chain on crane operating elevator becoming untied.
Oct. 3.	Alex. J. Murphy, . .	40	Cambria Iron Company,	Johnstown,	Rolls,	Caught between rolls and derrick; one leg broken and badly bruised.
Oct. 3.	James Flannigan, . .	21	do. do.	do.	Ladder,	Fell from a ladder and broke his arm.
Oct. 4.	Ross Wilson,	16	Johnson Company,	do.	Belting,	Both wrists fractured by falling from a pulley belt.
Oct. 6.	Chas. Strottle, . . .	30	Carnegie Steel Company,	Munhall,	Crane,	Crane caught him in the stomach, resulting seriously.
Oct. 8.	John Wilson,	20	Shiffler Bridge Company,	Pittsburg,	Punching machine,	Cut in eye, by silver from punching machine.
Oct. 9.	A. D. Penrod, . . . .	. . .	Johnson Company,	Johnstown, . . . . .	. . . . .	Two ribs broken, two cuts on face, back, right arm and shoulder badly bruised by a load of blooms being thrown from truck.
Oct. 11.	M. Metril,	21	Pittsburg Forge and Iron Co.,	Allegheny, . . . . .	. . . . .	Driving axle fell on his foot mashing his toe.

ACCIDENTS—Continued.

Date of accident.	PERSONS INJURED.	Age.	Establishment in which accident occurred.	Location.	Machine, etc., on which accident occurred.	Particulars and extent of injury.
Oct. 11.	Andrew Danks, . . .	21	Cambria Iron Company,	Johnstown, . . . . .	. . . . .	Slipped and fell breaking his leg.
Oct. 12.	G. W. Kels,	30	do.	do.	Railroad track,	Arm crushed while coupling cars.
Oct. 12.	John Lucinski, . . .	24	Oliver Iron and Steel Company, . .	Pittsburg, . . . . .	. . . . .	Four fingers of right hand taken off while coupling cars.
Oct. 15.	John Wood,	30	Carnegie Steel Company,	Munhall,	Railroad in mill yard,	Killed by locomotive.
Oct. 17.	Eugene Garlitz, . . .	. . . . .	do.	Bessemer, . . . . .	. . . . .	Left foot mashed at instep while in the act of coupling cars.
Oct. 18.	E. W. Earnest, . . .	39	do.	Duquesne, . . . . .	. . . . .	Tongs slipping from bloom, contusion and lacerated wound on head.
Oct. 24.	Wm. Walter,	35	Oliver Iron and Steel Company, . .	Pittsburg, . . . . .	. . . . .	Was run over by a loaded truck, foot crushed.
Oct. 26.	Walter Suloriski, . .	50	Park Bros. & Co.,	do. . . . .	. . . . .	Was assisting to weigh a plate of steel when it fell on him causing fracture of the leg.
Oct. 27.	Chas. Gasenski, . . .	27	Carnegie Steel Company,	do. . . . .	. . . . .	Leg broken in two places by a piece of steel falling on it.
Nov. 5.	Owen Melvin,	26	Cambria Iron Company,	Johnstown,	Railroad track in mill yard, . .	Struck by engine's hip broken.
Nov. 7.	Wm. Rundle,	22	do.	do.	Hammer in forge plant,	Struck by a lever; skull fractured, resulting in his death.
Nov. 10.	Lewis Geviara,	23	Carnegie Steel Company,	Munhall,	Hydraulic pump,	Fracture of hip bone; carelessness.
Nov. 10.	John Moak,	35	do.	Pittsburg, . . . . .	. . . . .	Crane chain broke while lifting steel blooms; small bone in leg broken.
Nov. 11.	Stephen Kalna,	30	Cambria Iron Company,	Johnstown, . . . . .	. . . . .	Stepped on a tilting cylinder; foot mashed.
Nov. 14.	Benjamin Ross,	17	Carnegie Steel Company,	Munhall, . . . . .	. . . . .	Run over by locomotive; both legs crushed.
Nov. 15.	Hanson Ortelow, . . .	31	do.	do. . . . .	. . . . .	Leg crushed; by mould falling on it, necessitating amputation.

Nov. 20,	Chas. Bosmilster, . .	35	Oliver Iron and Steel Company, .	Allegheny, . . . . .	. . . . .	Burned on face and hands, not seriously, by explosion of gas.
Nov. 21,	Stephen Malerick, .	36	Cambria Iron Company,	Johnstown,	Cold saw.	Struck by an axle bar; leg broken.
Nov. 24,	Wm. Grossberger, .	26	Erie City Iron Works,	Erie. . . . .	. . . . .	Tool in slotter caught finger and cut it, not seriously.
Nov. 26,	Mike Dugush. . . .	26	Carnegie Steel Company,	Duquesne, . . . . .	. . . . .	Left arm and right leg crushed; necessitating amputation; resulting death.
Nov. 26,	Mr. Pleuski,	21	Erie City Iron Works,	Erie,	Crane,	Foot crushed, not seriously, by traveling crane falling from tramway.

REPORTS OF M. N. BAKER, THIRD DISTRICT, FOR THE YEAR 1892.

PITTSBURG, PA.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.			Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12.	12 to 16.			
Star Brick Works,	Fire brick,	295	..	..	15	Dec. 4.		
U. S. Glass Company (Factory A),	Tableware,	138	22	..	18	Dec. 7.		
Westinghouse Electric Company,	Electrical goods,	638	52	..	10	Dec. 10.		
U. S. Glass Company (Factory L),	Tableware,	191	15	..	42	Dec. 11.		
Reymer & Bro.,	Confectionery,	42	38	..	4	Dec. 11.		
Rex Box Factory,	Paper and wood boxes,	15	30	..	8	Dec. 11.		
Stevenson & Foster,	Printing,	43	17	..	7	Dec. 26.		
A. Walker & Son,	Paper boxes,	6	25	..	7	Dec. 28.	Comply with sections 2, 3, 7 and 10, and erect fire escape.	Complied.
Carnegie, Phipps & Co.,	Iron and steel,	1,350	..	..	44	Dec. 29.		
Carnegie, Phipps & Co.,	do.	1,000	..	..	18	Dec. 29.		
Campbell & Dick,	Dry goods,	87	48	..	10	Dec. 31.		
S. Kaufman Sons,	Clothing,	10	60	..	1	Dec. 31.		
Shiffler Bridge Company,	Iron,	127	..	..	10	Jan. 5.		
Hostetter Company,	Hostetters bitters,	81	4	..	7	Jan. 5.		
McConway & Foley Company,	Malleable iron castings,	538	12	..	6	Jan. 5.		
Bennett's Book Bindery,	Blinding,	18	17	..	..	Jan. 6.	Supply new cable to elevator,	Complied.
Jos. Horne & Co.,	Dry goods, etc.,	261	164	..	57	Jan. 6.		

Irwin's Book Bindery,	Bindery,		12	do.	Jan. 6.
Owen & Co.,	Cigars,	7	25	5	Jan. 7.
Wallace Bros.,	Laundry,	3	14	do.	Jan. 7.
Geo. A. Macbeth,	Glass chlmneys, shades, etc.,	400	30	48	Jan. 12.
J. Kaufman & Bros.,	Clothing and furnishing store,	250	80	69	Jan. 12.
Henry Holtzman & Sons,	Piano covers,	3	17	8	Jan. 13.
John Dunlap & Co.,	Tin and japanned ware,	53	37	do.	Jan. 13.
John P. Knable & Co.,	Dry goods,	15	15	6	Dec. 13.
Oil Well Supply Company,	Wrought iron pipes,	500	19	do.	Dec. 14.
Moorhead McClean Company,	Iron,	1,000	12	do.	Dec. 14.
Geo. McDonald & Co.,	Confectionery,	5	17	do.	Dec. 14.
American Iron and Steel Works,	Iron and steel,	3,400	128	do.	Dec. 15.
South Side Laundry,	Laundry,	6	18	do.	Dec. 15.
Godfrey & Clark,	Paper stock,	7	13	do.	Dec. 16.
					Complied.
					Safeguards to elevator, hand rails on stairs and drop ladders on fire escape, and weights on windows leading to fire escape; designate water closets.
M. Wagman,	Cigars,	8	10	1	Jan. 22.
Sidenburg & Rich,	Ladies' cloaks and wraps,	10	20	Fair,	Jan. 22.
					Complied.
Star Encaustic Tile Works,	Tile,	19	20	3	Jan. 25.
Danzinger & Co.,	Fancy goods, etc.,	24	156	29	Jan. 26.
Fleishman & Co.,	do. do.	25	65	22	Jan. 26.
Oliver Nut and Bolt Works,	Bolts and nuts,	109	124	26	Jan. 26.
Jas. McClurg & Co.,	Confectionery,	15	18	1	Jan. 27.
Guskey's Clothing Store,	Clothing,	120	5	23	Jan. 27.
Oppenheimer & Hancock,	Shirts,	9	21	do.	Mar. 7.
					Complied.
Raugh Bros. & Co.,	do.	2	33	do.	Mar. 7.
Standard Cable Company,	Underground cables,	60	15	3	Mar. 8.
Star Brick Works,	Fire brick,	240	12	do.	Mar. 8.
					Complied.
					Comply with sections 1 and 10, and erect fire escape.
					Comply with section 7 and erect fire escape.

PITTSBURG, PA.—Continued.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.			Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12.	12 to 16.			
People's Store,	Dry goods, etc.,	79	46	..	8	Mar. 9.		
Jos. Horne & Co.,	do.	261	164	..	57	Mar. 9.	Erect fire escape,	Complied.
United States Glass Co., (Factory K),	Tableware,	350	30	..	47	Mar. 10.	Comply with section 7 and clear from obstruction the passage to fire escape.	Complied.
United States Glass Co., (Factory B),	do.	250	20	..	40	Mar. 10.	Comply with section 10 and provide additional means of egress in case of fire.	Complied.
Rex Box Company,	Boxes,	15	30	..	6	Mar. 11.	Provide hand rails at stairs leading to cellar; box fly wheel of engine in basement.	Complied.
John Hamilton,	Tin and tinware,	72	34	..	10	Mar. 21.	Comply with section 7.	
Matchett Paper Box Company,	Paper boxes,	2	10	..	2	Mar. 22.	Comply with section 7,	Complied.
Reymer & Bro.,	Confectionery,	30	30	..	..	Mar. 23.	Erect fire escape and post notices leading to same.	Complied.
Mrs. C. Weiner,	Dry goods,	21	24	..	3	Mar. 24.	Erect fire escape,	Complied.
Biber & Easton,	do.	25	20	..	1	Mar. 24.	Erect fire escape,	Complied.
Mrs. J. M. Guskey,	Clothing store,	169	11	..	17	Mar. 25.	Erect two fire escapes.	
J. Kaufman Bros.,	do.	210	70	..	48	Mar. 25.	Erect fire escape.	
Stevenson & Foster,	Printing and binding,	41	19	..	6	Mar. 28.		
Pennsylvania Box Company,	Paper boxes,	10	37	..	3	Mar. 28.	Keep entrance to fire escape free and clean; post notice at fire escape showing location.	Complied.
Heinz Bros. Company,	Pickling,	13	20	..	3	Mar. 31.	Erect fire escape and comply with section 7.	Partly complied.
S. D. Ache & Co.,	Confectionery,	23	12	..	..	April 1.	Erect fire escape,	Complied.
Sidenburg & Riehl,	Cloaks and wraps,	20	30	..	..	April 18.	Comply with section 10,	Complied.

J. A. Galvin's Root Beer Factory,	Root beer extracts,	2	12	Good,	April 19,	Erect iron fire escape,	Complied.
Novelty Candy Company,	Fine candles,	10	8	2	April 19,	Provide automatic safeguards at all landings of the elevator.	Complied.
Camp & Wilson,	Cigars,	28	12	1	April 20,	Comply with section 10 and erect fire escape.	Complied.
Oswald Werner,	Dyeing and scouring,	15	10	Good,	April 21,	Erect fire escape,	Complied.
Lutz Bros.,	Pickles,	10	15	do.	April 22,	Erect fire escape,	Complied.
Rex Box Factory,	Wood and paper boxes,	16	31	7	April 25,		
Collin's Cigar Company,	Cigars and tobies,	31	205	98	April 25,		
Raugh Bros. & Co.,	Shirts,	51	35	1	May 3,		
Jos. Horne & Co.,	Dry goods, etc.,	205	165	58	May 4,		
W. N. Matchneer,	Wood and paper boxes,	19	16	4	May 4,		
Pearl Laundry,	Laundry,	2	32	1	May 5,		
Matchett Paper Box Company,	Paper boxes,	3	17	3	May 16,		
Walker Box Company,	do.	5	34	6	May 16,		
Reymer & Bro.,	Confectionery,	38	32	2	May 17,		
J. Kaufman Sons & Co.,	Pantaloon,	15	125	3	May 17,		
Klee & Talk,	do.	10	65	3	May 18,		
Henry Holtzman's Sons,	Piano covers,	8	17	8	May 18,		
Shifter Bridge Works,	Structural works,	132	11	do.	May 19,		
Star Brick Works,	Fire brick,	312	19	do.	May 19,		
Baner & Wieland,	Corks,	14	16	5	May 24,	Cover string of shafting running near floor; apply safeguards to slicing and tapering knives; post notices leading to fire escape, and provide a red light at stairways and an alarm gong or bell to be used as a fire alarm.	Complied.
Davees Manufacturing Company,	Painting signs, etc.,	16	8	2	May 24,	Erect fire escape	Complied.
Westinghouse Electric Company,	Electric goods,	1,025	77	14	May 25,	Provide automatic safeguards at all elevator landings; post notices leading to fire escape; provide red light at head and foot of stairway and a gong or bell to be used as a fire alarm.	
Jos. Klee & Sons,	Pantaloon,	5	60	1	May 25,		
R. & W. Jenkinson Company,	Cigars and tobies,	50	136	17	May 25,	Erect an additional fire escape,	Complied.

PITTSBURG, PA.—Continued.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.			Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12.	12 to 16.			
J. T. & A. Hamilton,	Glass bottles,	210	. . . . .	. . . . .	. . . . .	May 31.		
Carnegie, Phipps & Co.,	Iron and steel forgings,	850	. . . . .	. . . . .	11	June 1.	Guard fly wheel or pulley near entrance of mill at office.	Complied.
W. H. Hamilton & Co.,	Glass bottles,	285	. . . . .	. . . . .	111	June 1.		
Electric Laundry,	Laundry,	11	53	. . . . .	3	June 3.		
Wm. McCulley & Co.,	Glass bottles,	144	. . . . .	. . . . .	59	June 3.	Discharge boy without certificate,	Complied.
Wm. McCulley & Co.,	do.	97	. . . . .	. . . . .	39	June 3.		
Fleishman & Co.,	Fancy goods,	60	80	. . . . .	26	June 7.	Erect outside fire escape,	Complied.
Raugh Bros. & Co.,	Shirts,	41	39	. . . . .	. . . . .	June 8.		
Stevenson & Foster,	Printing,	44	20	. . . . .	5	June 8.		
Jas. McKay & Co.,	Chains,	45	. . . . .	. . . . .	18	June 10.		
U. S. Glass Co., Factory L,	Glass tableware,	111	17	. . . . .	12	June 10.		
John Dunlap & Co.,	Tinware,	40	50	. . . . .	2	June 15.	Automatic safeguards at all landings of elevator; erect outside iron fire escape.	Complied.
Fleming Bros.,	Patent medicine,	4	11	. . . . .	. . . . .	June 15.	Automatic safeguard to elevator now in use where girls are employed.	
Pittsburg Moccasin Company,	Moccasin slippers, shoes, etc.,	12	23	. . . . .	2	June 16.	Keep closets clean; designate women's closet.	Complied.
J. D. Chantler & Co.,	Shoe uppers,	3	11	. . . . .	. . . . .	June 16.		
Danzinger & Co.,	Fancy goods,	34	86	. . . . .	40	June 17.		
U. S. Glass Co., Factory K,	Tableware,	340	30	. . . . .	42	June 20.		

Factory	Goods	No. of employees	No. of injured	No. of fatalities	Remarks	Date	Remarks	Complied.
Oliver Iron and Steel Company, . .	Bolts and nuts,	120	115	28	do.	June 21,	Erect outside iron fire escape,	Complied.
Armstrong Cork Company,	Corks,	400	600	127	do.	June 23.		
Barnes Bros.,	Laundry,	37	66	3	do.	June 23,	Cover gear on mangle and in any other place where gears are exposed.	Complied.
H. J. Lynch,	Dry goods,	15	10	...	do.	June 24.		
Collins & Wright,	Britannia goods,	17	10	...	do.	June 24.		
Oil Well Supply Company,	Wrought iron pipes, etc., . .	900	...	23	do.	June 29.		
U. S. Glass Co., Factory A,	Tableware,	135	20	23	do.	June 29.		
U. S. Glass Co., Factory F,	do.	99	9	20	do.	June 30.		
Biber & Easton,	Dry goods,	20	20	2	do.	June 30.		
J. G. Bennet & Co.,	Printing and binding,	21	16	...	do.	July 1.		
Soho Copper Works,	Copper and brass plates, . . .	40	...	14	do.	July 1.		
Collins' Cigar Company,	Cigars and tobles,	22	196	85	Fair,	July 7.		
Penn Box Company,	Paper boxes,	9	32	8	Good,	July 8.		
Raugh Bros.,	Shirts,	2	38	...	do.	Oct. 3.		
Penn Paper Box Company,	Paper boxes,	12	34	13	do.	Oct. 3.		
Banar & Wieland,	Corks,	12	16	5	do.	Oct. 4.		
Matchett Paper Box Company, . . .	Paper boxes,	3	12	5	Bad.	Oct. 4.	Comply with sections 2 and 3; Improve women's water closet; keep shop clean of waste on floor.	
Walker Box Factory,	do.	5	31	8	Good,	Oct. 4.	Comply with sections 2 and 3,	Complied.
Rex Box Factory,	Boxes,	29	17	12	do.	Oct. 5.	Cover all set screws in a substantial man- ner.	
S. Kaufman & Sons,	Pantaloon,	10	90	...	do.	Oct. 5.		
Pittsburg Moccasin Company, . . .	Moccasins,	8	25	...	do.	Oct. 5.		
Kaufman & Bros.,	Clothing, etc.,	250	140	50	do.	Oct. 5.		
Sidenburg & Rich,	Cloaks,	7	50	...	Bad,	Oct. 5.	Closet accommodations for women are in- sufficient and must be enlarged; men's closet must be put in clean condition.	Complied.
W. W. Matchreer,	Cigar boxes,	21	17	5	Good,	Oct. 6.		
Klee & Talk,	Pantaloon,	4	80	...	do.	Oct. 6.	Provide elevator with full automatic safe- guards at all landings where workmen and girls are employed.	

PITTSBURG, PA.—Continued.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.				Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12.	12 to 16.				
J. M. Guskey,	Clothing,	209	39	..	35	Good.	Oct. 6.		
Dillworth & Co.,	Coffee roasting and packing,	7	19	..	..	do.	Oct. 6.	Automatic safeguards to all elevator landings.	
Joseph Klee & Sons,	Pantaloon,	6	40	..	3	Fair.	Oct. 6.	Automatic safeguards at all landings of elevator.	
B. & W. Jenkinson Company, . .	Cigars and tobles,	49	140	..	23	do.	Oct. 11.		
Joseph Horne & Co.,	Dry goods,	275	160	..	58	do.	Oct. 11.		
Armstrong Cork Company,	Corks,	400	600	..	125	do.	Oct. 12.	Provide safeguards at lower landing of elevator in tapering room; cover set screws on tapering machine; place light in women's closet; heat dressing room; designate water closets.	
Fleishman & Co.,	Fancy goods, millinery, etc.,	20	100	..	20	Good.	Oct. 12.	Provide further closet accommodations for females; full free exit to fire escape; windows properly weighted or open on hinges; post notice at each exit reading "fire escape."	
Biber & Easton,	Dry goods,	17	18	..	..	do.	Oct. 12.		
Oliver Iron and Steel Company, .	Bolts and nuts,	103	162	..	33	Bad.	Oct. 13.		
U. S. Glass Co. (Factory L), . . .	Glassware,	242	23	..	25	do.	Oct. 14.	Provide for proper supply of water in wash rooms and closets; hot water should be supplied in wash room; post notice to fire escape; free and unobstructed exit thereto at all landings of said escapes.	
Electric Laundry,	Laundry,	3	40	..	3	Good.	Oct. 14.		
Standard Underground Cable Co.,	Underground cables,	70	30	..	10	do.	Oct. 14.		

M. Oppenheimer & Co.,	Clothing,	35	140	..	5	do.	Oct. 14.	Provide full automatic safeguard to freight elevators; box belts and provide easy exit at the present fire escape; the present escape is not sufficient; enlarge and improve the balconies at this escape, and erect additional one.
Henry Oppenheimer,	Shirts,	3	40	..	2	do.	Oct. 14.	Provide sufficient water for flushing closets and washing purposes in factory; guard elevator with full automatic protection.
John Dunlap & Co.,	Tinware,	50	50	..	2	do.	Oct. 17.	Repair elevator gates,
Reymer & Bro.,	Confectionery,	50	45	..	..	do.	Oct. 17.	Compiled.
Henry Holtzman & Sons,	Piano spreads,	2	35	..	9	do.	Oct. 18.	
Stevenson & Foster,	Printing,	43	20	..	5	do.	Oct. 19.	
Marvin Branch U. S. Baking Co.,	Bakery,	125	175	..	28	do.	Oct. 21.	
Collins' Cigar Company,	Cigars,	32	208	..	97	do.	Oct. 24.	
Westinghouse Electric Company,	Electric lamps, etc.,	1,772	140	..	30	do.	Oct. 24.	Provide full free egress at the two iron fire escapes now in position. egress to be unobstructed; enlarge balconies on escape leading to alley, or erect additional balcony escape.
Deweese Manufacturing Company,	Sign painting, etc.,	19	9	..	2	do.	Oct. 26.	
Oswald Werner,	Dyeing and scouring,	16	10	..	1	do.	Oct. 27.	
Troy Laundry,	Laundry,	41	61	..	4	do.	Oct. 27.	
Heintz Bros. & Co.,	Pickles, etc.,	6	34	..	1	do.	Oct. 28.	Automatic safeguards at all landings of the elevator.
U. S. Glass Company,	Glass tableware,	156	30	..	15	do.	Oct. 28.	Clear exit to fire escape.
McDonald & Co.,	Candles,	3	25	..	1	do.	Oct. 28.	
Mrs. C. S. Weissert,	Dry goods, etc.,	21	24	..	3	do.	Oct. 31.	
Horne & Ward,	Trimings, notions, etc.,	44	47	..	16	do.	Oct. 31.	
U. S. Glass Co. (Factory B),	Glass tableware,	259	40	1	51	do.	Nov. 1.	Discharge boy under 12 years of age,
Empire Laundry Company,	Laundry,	7	16	..	..	do.	Nov. 1.	Compiled.
Star Encaustic Tile Company,	Flooring tiles, etc.,	16	24	..	1	Fair,	Nov. 4.	
Deweese Manufacturing Company,	Painting signs, etc.,	20	10	..	2	Good,	Nov. 22.	
United States Glass Co., Plant P.	Tableware,	103	9	..	22	do.	Nov. 23.	

PITTSBURG, PA.—Continued.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.				Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12.	12 to 16.				
United States Glass Co., Plant A.	Tableware,	140	20	..	26	Good.	Nov. 23.		
Fleming Bros.,	Patent medicines,	6	10	..	..	do.	Nov. 23.		
S. D. Ache & Co.,	Confectionery,	24	14	..	..	do.	Nov. 25.		
Rex Box Factory,	Cigar boxes,	30	17	..	5	do.	Nov. 25.		

BLAIRSVILLE, PA.

West Penn Glass Company, . . .	Bottles,	184	6	..	40	Fair,	Dec. 19,	Comply with sections 1, 2, 3 and 10,	Complied.
West Penn Glass Company, . . .	do.	165	5	..	35	Good,	May 11.		

JOHNSTOWN, CAMBRIA COUNTY, PA.

Johnson Company,	Steel rails and track material,	645	5	..	12	Good,	Jan. 19,	Erect fire escape,	Complied.
Cambria Iron Company,	Iron, steel and agricultural implements,	6,898	2	..	70	do.	Jan. 20,	Comply with section 12,	Complied.
Penn Traffic Company,	General stock store,	65	6	..	7	do.	Jan. 20,	Provide elevators with safety locks,	Complied.

ALTOONA, PA.

Altoona Silk Mill.	Silk spooling.	42	65	58	Dec. 15.	Comply with sections 1, 2, 3, 10 and 12, . . .	Complied.
Allegheny Fire Clay Works, . . .	Fire brick,	40	. . . . .	10	Dec. 16.	
Altoona Machine Shops, P. R. R. Co.	Repair shop,	3,000	20	Dec. 17.		

LATROBE, PA.

Whitman & Denman,	Shoes,	57	8	3	Dec. 18.		
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ROCHESTER, PA.

Rochester Tumbler Company, . .	Glass tumblers,	484	116	134	June 14.		
Point Bottle Works Company, . .	Glass bottles,	71	10	18	June 15.		

NATRONA, PA.

Pennsylvania Salt Manufacturing Company.	Chemicals, acids, salts, etc.,	600	40	Dec. 3.		
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CREIGHTON, PA.

Pittsburg Plate Glass Company, .	Plate glass,	488	12	28	Dec. 3.		
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WILKINSBURG, PA.

Park Place Laundry,	Laundry,	45	85	8	Dec. 4.		
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KNOXVILLE BOROUGH, PA.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.				Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12.	12 to 16.				
Pittsburg Shoe Company,	Men's shoes,	28	12	..	1	Good,	Dec. 4.		

FORD CITY, PITTSBURG, PA.

Pittsburg Plate Glass Company, .	Plate glass,	995	5	..	24	Good,	Dec. 2.		
Pittsburg Plate Glass Company, .	do. do.	994	6	..	25	do.	July 6.		

TARENTUM, PA.

Pittsburg Plate Glass Company, .	Plate glass,	792	8	..	15	Good,	Dec. 3.		
Godfrey & Clark,	Paper bags, etc.,	70	30	..	4	do.	Dec. 3.		
United States Glass Company, Factory E.	Tableware, etc.,	118	23	..	15	do.	Mar. 2.		
United States Glass Company, . .	Tableware, lamps, etc., . . .	350	125	..	168	do.	Mar. 2.		
C. L. Flaccus Glass Company, . .	Bottles,	322	..	..	87	do.	Mar. 2.		
Godfrey & Clark,	Paper bags, etc.,	71	33	..	9	do.	Mar. 2.		Guard belts and pulleys; cover keys on end of balance wheel shaft.

PITTSBURG, SOUTH SIDE, PA.

Dilworth, Porter & Co.,	Railroad and boat spikes, . .	350	. . . .	10	Good,	Dec. 22.	Complied.
United States Glass Company, Factory K.	Tableware,	350	30	47	do.	Jan. 11.	
United States Glass Company, Factory F.	do. do.	214	21	28	do.	Jan. 13.	Provide safeguards at all landings of elevator and erect fire escape.
Hogan, Evans & Co.,	Glass chimneys,	257	8	60	do.	Jan. 28.	Complied.
Thomas Evans & Co.,	Lamps,	542	38	47	do.	Jan. 28.	
United States Glass Company, . .	Tableware,	155	30	20	do.	Mar. 15.	
Scutt Wire Company,	Barbed wire,	200	100	16	do.	Mar. 15.	
Armstrong Bro. & Co.,	Corks,	400	600	127	Fair,	Mar. 16.	Comply with section 7, 10 & 12.
Weyman & Bro.,	Smoking tobacco and snuff, .	53	33	1	Good,	Mar. 17.	Complied.
United States Baking Company (Marvins' Branch).	Bread, etc.,	125	200	37	do.	Mar. 18.	
R. W. Jenkinson & Co.,	Cigars,	50	150	17	do.	Mar. 18.	Complied.
United States Glass Company, Factory K.	Glass tableware,	331	23	66	do.	Oct. 26.	

ALLEGHENY CITY, PA.

Western Leather Company, . . .	Sole leather,	5	62	22	Good,	Dec. 8.	Complied.
H. J. Heinz Company,	Pickling and preserving, . . .	250	248	72	do.	Dec. 8.	
Allegheny Steam Laundry, . . .	Laundry,	21	47	1	do.	Dec. 9.	
Union American Cigar Company,	Cigars and tobies,	9	271	59	do.	Dec. 9.	Complied.
Pennsylvania Cotton Mill, . . .	Coarse cotton cloth,	31	187	57	do.	Dec. 10.	
M. Brilles & Co.,	Cigars and tobies,	16	116	17	do.	Dec. 11.	

Racks ordered on floor for women to stand on when at the wash tub.

Cover set-screws,

Provide automatic device for opening and closing each landing of elevator.

ALLEGHENY CITY, PA.—Continued.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.				Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12.	12 to 16.				
Pittsburg Baking Company, . . .	Crackers and pretzels,	6	14	..	3	Fair,	Dec. 11,	Comply with sections 10 and 12.	
James McClurg & Co.,	Bakery,	20	22	..	..	Good,	Dec. 14,		
Cruikshank, Bro. Company, . . .	Pickling,	10	15	..	..	Fair,	Dec. 22,	Comply with sections 2, 3 and 7, and window ventilation in women's dress room and closet, by means of sliding sash; designate women's closet.	Complied.
Conroy & Prugh,	Mirrors,	28	31	..	14	Good,	Dec. 23,		
Schimmel Preserving Company, .	Preserves and pickles,	22	10	..	..	do.	Dec. 23,		
Pittsburg Brass Company,	Brass lamps,	130	..	..	20	do.	Dec. 30,		
Klopper's Clothing House,	Gents' clothing,	8	12	..	..	Fair,	Jan. 7,	Screen and cleanse water closets and erect fire escape.	Complied.
Leonard Wagner,	Cigars,	11	30	..	..	Bad,	Jan. 7,	Provide watercloset for women; screen and designate them and provide better ventilation in workrooms.	Complied.
McKinney Manufacturing Co., . .	Hinges,	132	68	..	65	Good,	Jan. 8,		
Boggs & Buhl,	Dry goods,	175	125	..	36	do.	Jan. 18,		
Rankin & Holdship,	Tinware,	30	20	..	1	do.	Jan. 18,		
National Casket Company,	Caskets, coffins, etc.,	255	45	..	20	do.	Jan. 22,		
Cruikshank Bros. & Co.,	Pickles,	8	23	..	1	do.	Mar. 7,	Erect fire escape.	Complied.
Godfrey & Clark,	Paper stock,	6	34	..	4	do.	Mar. 9,		
H. J. Heinz Company,	Pickles and preserves,	250	248	..	72	do.	Mar. 11,	Gates to elevator, and guard engine in room No. 3.	Complied.
Western Leather Company,	Leather from scrap,	5	62	..	23	do.	Mar. 11,	Comply with section 7.	Complied.

Collin's Cigar Company,	Cigars,	18	202	95	do.	Mar. 11,	Provide better ventilation and erect fire escape.	Complied.
Conroy & Prugh,	Mirrors, etc.,	37	31	14	do.	Mar. 21,	Erect fire escape,	Complied.
Pittsburg Baking Company, . . .	Bakery,	8	12	3	do.	Mar. 31,	Erect fire escape,	Complied.
M. Brilles & Co.,	Cigars,	4	116	14	do.	April 1,		
Chas. Kopper,	Clothing,	19	16	..	do.	April 22,		
Cruikshank Bros. & Co.,	Pickling,	15	25	2	do.	April 25,		
Walker Soap Factory,	Laundry soaps,	67	28	..	do.	April 26,		
Lennox Cigar Company,	Fine cigars,	12	30	12	Fair,	April 26,	Enlarge women's water closet to at least double its present capacity.	Complied.
H. W. Minnemyer & Co.,	Harness, hardware,	125	..	..	Good,	April 27,	Comply with section 2.	Complied.
Wrigley Box Factory,	Paper boxes,	8	24	4	do.	April 28,		
Linniken Hat Bleachery,	Dye house and bleaching, . . .	10	50	..	do.	April 28,		
C. Erbenmyer,	Tobies,	2	16	6	Fair,	April 29,	Comply with sections 2, 3 and 10,	Complied.
Union American Cigar Company,	Cigars and tobies,	18	265	59	Good,	April 29,		
G. I. Holdship,	Tinware,	22	34	1	Good,	May 3,		
American Preserve Company, . .	Pickles and preserves,	12	13	1	do.	May 5,		
U. S. Baking Co. (Herd Branch),	Bakery,	27	19	..	do.	May 6,	Erect outside iron fire escape,	Complied.
McClurg & Co.,	do.	22	20	..	do.	May 6,	Erect outside iron fire escape.	
Union American Cigar Company,	Cigars and tobies,	5	278	60	do.	May 26,		
McKinney Manufacturing Co., . .	Hinges,	137	60	59	Fair,	May 27,	Disinfect water closets,	Complied.
Lizgett Spring and Axle Co., . . .	Vehicle springs and axles, . .	317	..	40	Good,	May 27,		
Baker Chain Works,	Chains and agricultural im- plements,	270	..	11	do.	June 2,		
Pittsburg Brass Company,	Brass lamps, etc.,	125	..	17	do.	June 2,	Free egress to fire escape; alarm gong or bell; also have stairway lighted with red light after dark.	Complied.
Godfrey & Clark,	Paper stock,	11	35	4	do.	June 6,	Provide alarm bell or gong to be used in case of fire; have fire escape braced from under slide and provide suitable steps in place of rung ladder now in use, so that women may descend with safety.	Complied.
M. Brilles & Co.,	Cigars,	5	127	18	do.	June 7,	Provide gong or bell to be used in case of fire, see that exit to fire escape is clear and unobstructed at all times.	Complied.

ALLEGHENY CITY, PA.—Continued.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.			Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12. 12 to 16.				
Wentz, Stewart & Anderson, . . .	Cigars,	6	182	..	44	June 9.		
Conroy & Prugh,	Mirrors, frames, etc.	40	32	..	15	June 9.		
Lennox Cigar Company,	Fine cigars,	3	57	..	17	June 21.		
H. J. Heinz Company,	Pickling and preserving, . . .	158	175	..	32	June 22.		
Lindsey & McCutcheon,	Iron and steel,	315	..	..	12	June 25.		
American Preserve Company, . . .	Preserves and pickles,	17	14	..	1	June 27.		
Boggs & Buhl,	Dry goods,	168	110	..	36	June 28.		
U. S. Baking Co. (Herd Branch), .	Bakery,	27	20	..	..	July 8.		
Union American Cigar Co.,	Cigars,	10	274	..	38	Oct. 4.		
Godfrey & Clark,	Paper stock,	5	40	..	8	Oct. 7.		
M. Brilles & Co.,	Cigars,	11	131	..	17	Oct. 7.		
G. H. Holdship,	Tinware,	11	18	..	..	Oct. 7.	Automatic safeguards to all landings to elevator; present gate must be kept in order.	Complied.
E. J. Wrigley,	Paper boxes,	3	25	..	8	Oct. 7.		
Conroy & Prugh,	Mirrors, etc.,	36	45	..	11	Oct. 13.	Comply with section 3; keep exits to fire escapes clear from obstruction, windows at escapes to be on balance weights, etc.	Complied.
U. S. Baking Co. (Herd Branch), .	Bakery,	26	30	..	3	Oct. 13.		
Cooper Excelsior Works,	Excelsior,	14	..	..	10	Oct. 18.	Comply with sections 2, 3 and 9.	
James McClurg & Co.,	Bakery,	23	23	..	1	Oct. 18.		
Baker Chain Works,	Agricultural implements, . . .	250	..	..	34	Oct. 19.		

H. J. Heinz Company,	Pickles, preserves, etc., . .	235	335	50	do.	Oct. 20.
Western Leather Company, . .	Leather,	6	70	31	do.	Oct. 20.
Crukshank Bros.' Company, . .	Pickling,	17	25	. .	do.	Oct. 21.
Lenox Cigar Company,	Cigars,	2	50	16	do.	Oct. 25.
Boggs & Buhl,	Dry goods,	220	200	46	do.	Oct. 27.
Wentz, Stewart & Anderson, . .	Tobies and cigars,	7	183	43	do.	Oct. 27.
Hamilton, Lemon, Arnold & Co.,	Coffins, caskets, etc.,	174	56	9	do.	Nov. 21.
American Broom Company, . .	Brooms,	26	4	6	Fair,	Nov. 22.
Home Steam Laundry,	Laundry,	6	14	1	Good,	Nov. 24.
Wentz, Stewart & Anderson, . .	Cigars,	4	186	44	do.	Nov. 24.
G. I. Holdship,	Tinware,	12	18	. .	do.	Nov. 25.

Erect additional fire escapes.
Comply with sections 1, 2 and 3.

TTUSVILLE, PA.

Queen City Tannery,	Tannery and inner soles, . .	337	63	17	Good,	July 5,	Complied.
Comply with sections 2 and 3; designate women's closet; cover end of splitting knife; cover set screws on splitting machines and in all places where exposed. Box belt in room where girls are employed; erect outside fire escape.							

NEW BRIGHTON, PA.

Pioneer Twine Mills,	Hemp and twines,	89	71	59	Good,	April 12.	Complied.
Sherwood Bros. Pottery,	American Stone and Bristol Works.	99	30	21	do.	April 14.	
Standard Horse Nail Company, . .	Horse nails,	76	40	. .	do.	April 14.	
New Brighton Pottery Works, . .	Stoneware,	110	11	9	do.	April 15.	
New Brighton Pottery Works, . .	do.	114	11	9	do.	Nov. 17.	
Sherwood Bros. Pottery,	Stoneware and Clay Works, . .	92	30	22	do.	Nov. 17.	
M. T. & S. Kennedy,	Kegs, cooperage,	47	. . .	14	do.	Nov. 17.	
Pioneer Twine Mills,	Twine,	90	70	51	do.	Nov. 18.	

BEAVER FALLS, PA.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.				Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12.	12 to 16.				
Co-operative Glass Company, . .	Tableware,	138	. . . . .	. . . . .	20	Good,	April 12.		
The Mayer Pottery Company, . .	White ware,	81	26	. . . . .	9	do.	April 13.		
Western Flie Company,	Files,	86	14	. . . . .	14	do.	April 13.		
Art Tile Works,	Art tiles for mantels,	44	51	. . . . .	9	do.	April 15,		
Western Flie Company,	Files,	86	14	. . . . .	12	do.	Nov. 18.	Provide better ventilation; also have floor laid or board platform in dripping room so that women while at work may not be obliged to keep their feet on the tile or brick floor.	Complied.
Go-operative Glass Company, . .	Glass tableware,	164	6	. . . . .	20	do.	Nov. 18.		
Mayer Pottery Company,	White china goods,	79	28	. . . . .	9	do.	Nov. 18.		
Beaver Falls Art Tile Company, . .	Fine tile,	49	58	10	do.	Nov. 18.		

PARKER CITY, PA.

Thos. Wightman & Co.,	Glass bottles,	105	36	Good,	Nov. 4.
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JEANETTE, PA.

McKee & Bro.,	Glass tableware, etc.,	505	20	100	Good,	May 11.
Dithridge Glass Company,	Lamps, tableware, etc.,	452	48	42	do.	May 13.

GRAPEVILLE, WESTMORELAND COUNTY, PA.

Westmoreland Specialty Co., . .	Glass specialties,	98	34	. .	21	Good,	May 13,	Provide full automatic safeguard to elevator.	Complied.
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GREENSBURG, WESTMORELAND COUNTY, PA.

United States Glass Company, Factory G.	Glass tableware,	140	13	. .	27	Good,	May 12.		
Greensburg Glass Company, . . .	Lamps and tableware,	182	40	. .	55	do.	May 12.		
The Kelley & Jones Company, . .	Brass and iron fittings, . . .	237	4	. .	12	do.	May 12.		

SALTSBURGH, PA.

Saltsburgh Bottle Works.	Glass bottles,	75	26	Good,	May 10,	Comply with sections 1, 2, 3.	
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PHILLIPSBURG, PA.

Phoenix Glass Company,	Glassware,	338	70	. .	65	Good,	June 14.	Provide automatic safeguards at power elevator now in use.	
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ERIE, PA.

W. J. Sands,	Bakery,	6	12	. .	2	Good,	April 5.		
Lovell Manufacturing Company, . .	Animal traps, wringers, etc.,	100	29	do.	April 5,	Erect fire escape.	

ERIE, PA.—Continued.

NAME OF FACTORY OR WORKSHOP.	Goods manufactured.	NUMBER EMPLOYED.				Sanitary condition.	Date of inspection.	Orders given.	Compliance.
		Males.	Females.	Under 12.	12 to 16.				
Watson's Paper Mill,	Building paper,	347	18	..	7	Good,	April 6.	Erect fire escape,	Complied.
L. W. Simonds' Button Company, . .	Buttons,	28	12	..	5	do.	April 6.		
Herald Publishing and Printing Company,	Printing and binding,	64	28	..	10	do.	April 6.	Erect fire escape,	Complied.
Ashby & Vincent,	do.	30	20	..	1	do.	April 7.	Erect fire escape.	
Mauier Confectionery Company, . .	Confectionery and bakery, . .	42	23	..	..	do.	April 8.	Comply with section 7 and erect fire escape,	Complied.
Erie City Iron Works,	Engines and boilers,	600	..	..	24	do.	April 8.		
Nathan Cohen,	Fancy store,	10	15	..	2	do.	April 8.		
F. F. Adams Company,	Wringers, traps, etc.,	40	..	..	12	do.	April 8.		
Erie City Iron Works,	Engines and boilers,	575	..	..	17	do.	Nov. 10.		
Erie Button Company,	Pearl buttons,	32	24	..	..	do.	Nov. 10.	Provide elevator with full automatic safe guards.	
H. N. Thayer & Co.,	Baby carriages, wagons, etc., .	30	20	..	4	do.	Nov. 10.	Comply with sections 1, 2, 3.	
F. F. Adams,	Wringers and novelties, . . .	74	..	..	11	do.	Nov. 11.		
Watson Paper Mill Company, . .	Building papers, etc.,	398	17	..	10	do.	Nov. 11.		
Lovell Manufacturing Company, . .	Animal traps, wringers, etc., .	135	..	..	32	do.	Nov. 11.		
Mauier Confectionery Company, . .	Candies and bakery,	34	45	..	..	do.	Nov. 12.		
Erie Malleable Iron Company, . .	Malleable iron,	256	..	..	17	do.	Nov. 12.		
Pennsylvania Brass Company, . .	Brass fittings, valves, etc., .	53	..	..	13	Fair,	Nov. 12.		
Troy Steam Laundry,	Laundry,	3	20	..	..	Good.	Nov. 15.		

Ashby & Vincent,	Printing and binding,	30	20	. .	1	do.	Nov. 15.	
Erie Herald Publishing Company.	Printing and binding,	67	28	. .	5	do.	Nov. 15.	
Erie Pail Factory,	Pails, tubs, etc.,	75	. . . .	. .	. . .	Fair.	Nov. 16.	
Jerecki Manufacturing Company.	Foundry and pipe fitting, . .	700	. . . .	. .	46	Good,	Nov. 16.	

WASHINGTON, PA.

Hazel Glass Company,	Fruit jars,	107	12	. .	21	Good.	Mar. 29.	
Crescent Glass Company,	Tableware,	13	3	. .	8	do.	Mar. 29.	Complied.



RECAPITULATION OF LABOR BILLS CONSIDERED BY THE GENERAL ASSEMBLY DURING THE SESSION OF 1893, WITH THE ACTION TAKEN ON THEM.

SENATE BILLS.

No. 140. An act for the protection of human life and property along the line of railroads now constructed or hereafter to be constructed in the county of Crawford, requiring fences to be built along the line of said railroads by the company operating the same.

Defeated on final passage in the Senate.

No. 29. An act to empower boroughs and cities to establish a police pension fund to take property therefor, to contribute thereto and regulating and providing for the regulation of the same.

Passed in Senate, but failed in the House.

No. 31. An act relative to the admission and instruction of children of soldiers of the late war of the rebellion in the common schools of districts outside of those in which their parents, guardians or others, entitled to their custody may reside.

Passed.

No. 33. An act to extend the minimum school term to seven months.
Failed in the Senate on third reading.

No. 34. An act requiring the instruction and practice of physical culture in the public schools of the first and second class.

Passed both Houses, but was vetoed by the Governor.

No. 78. An act authorizing the sale of certain articles, and the performance of certain labor on the first day of the week, commonly called Sunday.

Failed on third reading in the Senate.

No. 99. An act regulating the organization and incorporation of secret fraternal, beneficial societies, orders or association and protecting the rights of members therein.

Failed on third reading in the Senate.

No. 129. An act to amend an act approved the twentieth day of May, A. D. 1889, to regulate the employment and provide for the safety of women and children in mercantile industries and manufacturing estab-

lishments, and to provide for the appointment of inspectors to enforce the same, and other acts providing for the safety or regulating the employment of said persons, and providing further regulations for the safety of persons so employed.

Passed.

No. 167. An act designating the days and half days to be observed as legal holidays, and for the payment, acceptance and protesting of bills, notes, drafts, checks and other negotiable paper on such days and on Sundays.

Passed.

No. 194. An act for the better protection of employes of railroad, mining and manufacturing companies and other wage-earners.

Reported from the Judiciary General Committee with a negative recommendation.

No. 214. An act to regulate the employment of the inmates of the penitentiaries, reformatories and work-houses.

Reported from the Judiciary General Committee with a negative recommendation.

No. 224. An act defining fraternal, beneficial and relief societies and their status, authorizing them to create subordinate lodges and to pay benefits on the sickness, disability or death of their members from funds collected by dues and assessments therein, providing for their registration in the office of the Insurance Commissioner, and requiring that they shall make annual reports to him, and exempting them from taxation and from the supervision of the Insurance Commissioner.

Passed.

No. 247. An act authorizing the printing and distribution of an extra edition of the Mine Inspector's reports of this Commonwealth.

Passed the Senate, but failed in the House for lack of time.

No. 286. An act to protect miners in the anthracite coal regions of Pennsylvania, to weigh coal and have a check-weighman when deemed necessary; defining the amount which shall constitute a ton, and to provide for the violation thereof.

Passed the House. Reported from the Senate Committee on Miners and Mining, with a negative recommendation.

No. 307. An act to protect the life and limbs of those employed in the construction of new buildings in this Commonwealth.

Passed.

No. 323. An act to provide for the health and safety of persons employed in and about the anthracite coal mines of Pennsylvania, and for

the protection and preservation of property connected therewith, approved June 2d, 1891, providing for the conveyance of powder, oil and tools to the miners in the mines.

Passed the House. Reported from the Senate Committee on Mines and Mining with a negative recommendation.

No. 324. An act to regulate the time of men employed in and about the coal mines of this Commonwealth.

Passed in the House. Reported from the Senate Committee on Mines and Mining with a negative recommendation.

No. 337. An act to authorize corporations organized for profit under the laws of Pennsylvania, to make allowances or pensions to employes for faithful and long continued service, who in such service have become old, infirm or disabled.

Passed.

No. 393. An act to provide for the adoption of trademark labels, symbols, or private stamps by any incorporated or unincorporated association or union of working men and to regulate the same.

Passed the Senate, but failed in the House.

No. 467. An act to establish boards of arbitration to settle all questions of wages and other matters of variance between capital and labor.

This was essentially a re-enactment of the existing law.

Passed.

No. 472. An act prohibiting the employment of any but American citizens in the erection, enlargement or improvement of institutions or public buildings or public works to which State funds are appropriated, except as provided herein.

Passed the House, but failed in the Senate on second reading.

No. 502. An act to prohibit the employment of any minor under the age of fifteen years in or about elevators.

Passed.

No. 579. An act to regulate the employment of railroad telegraph operators.

Passed the House, but failed in the Senate on second reading.

No. 670. An act securing to mechanics, journeymen and laborers the right to file liens against real estate for the amount of wages due for work or labor done in and about the erection and construction thereof.

Passed.

HOUSE BILLS.

No. 1. An act requiring manufacturers and merchants, or persons employing females to provide conveniencies by which such females, when not absolutely employed and obliged to be upon their feet, may be seated.

Failed on second reading in the House.

No. 37. An act to amend section one of an act, entitled "An act making the first Monday in September in each year a legal holiday to be known as Labor holiday, approved the twenty-fifth day of April, A. D. 1889." The amendment changed the day to the first Saturday in September.

Passed.

No. 75. An act to amend the first section of an act, entitled "An act authorizing school directors to purchase school books out of the district funds, approved June 25, 1885, by requiring school directors or controllers to furnish school books and other school supplies free of cost."

Passed.

No. 92. An act providing for the erection of the Pennsylvania Orphans' Industrial School. The purchase of land and the erection and equipment of the building and buildings necessary therefor. Making appropriations for such purpose, erection and equipment, and the maintenance of children admitted therein, placing the care of the same in the commission now known as the Commission of Soldiers' Orphan Schools of the State of Pennsylvania, and regulating the admissions to the said Pennsylvania Orphans' Industrial School and the said Soldiers' Orphan Schools.

Passed.

No. 107. An act relating to bituminous coal mines and providing for the lives, safety and welfare of persons employed therein.

Reported affirmatively. Recommitted to the Committee of Mines and Mining where it remained.

No. 127. An act providing for the licensing of unnaturalized male persons twenty-one years of age or over who reside or are employed within this Commonwealth.

Passed the House, but was not reported by the Senate Committee.

No. 142. An act to amend an act, entitled "An act relating to the support and employment of the poor, approved June 13, 1836."

Passed the House, but was not reported by the Senate Committee.

No. 209. An act to protect contractors, sub-contractors, laborers and persons furnishing materials to railroad companies in the construction of their railroads.

Passed the House, but was not reported by the Senate Committee.

No. 251. An act to prohibit the employment of any child in the Commonwealth of Pennsylvania under sixteen years of age, who has not attended school, at least six months, during the current school year, by any person or corporation in the State.

Reported with a negative recommendation by the Committee on Education.

No. 256. An act relative to the appointment of special deputies, marshalls or policemen, by sheriffs, mayors and other persons authorized by law to make such appointments, and providing against and making it a misdemeanor to bring or import persons to exercise the functions of such officers.

Passed.

No. 258. An act to provide for the examination and registration of miners in the anthracite coal regions of the Commonwealth, and to prevent the employment of incompetent persons therein.

Failed on third reading in the House.

No. 266. An act supplementary to an act, entitled An act relating to bituminous coal mines, and providing for the lives, health, safety and welfare of persons employed therein. Approved the 13th day of June, 1885.

Passed.

No. 441. An act to protect the health of mine workers in the State of Pennsylvania.

Failed on second reading in the House.

No. 801. An act to amend an act, entitled An act to amend the first section of an act, entitled An act for the better protection of the wages of mechanics, miners, laborers and others, approved, April 9th, 1872. Amending said act so that wages of servant-girls, washer-women, clerks and others shall be preferred and first paid out of the proceeds of the sale of the property of insolvent debtors owing wages to such servants or employes, approved, June 13th, 1883. Amending said act so as to increase the time during which the wages protected may be earned and the amount thereof.

Passed the House, but was not reported by the Senate Committee.

No. 131. An act to provide for the attendance of children in the schools of this Commonwealth.

This was known as the "Compulsory Education Bill." It passed both houses and was vetoed by the Governor.



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